

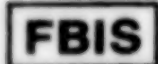
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USSR Report

AGRICULTURE

No. 1225



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CONTENTS	PAGE
REGIONAL DEVELOPMENT	
Review of 1979 Agricultural Progress, 1980 Prospects in Moldavia (G. Stepanov; SEL'SKOYE KHOZYAYSTVO MOLDAVII, Jan 80)...	1
Better Feed Held Key to Increased Animal Products (SEL'SKOYE KHOZYAYSTVO BELORUSSII, Jan 80).....	8
Shortcomings in Moldavian Livestock Production (SOVETSKAYA MOLDAVIYA, 23 Dec 79).....	14
Mogilev Area Farm Problems, Prospects (V.V. Prishchepchik; ZVYAZDA, 10 Feb 80).....	24
Vitebsk Area Farm Achievements, Plans (S.M. Shabashov; ZVYAZDA, 24 Jan 80).....	25
Farm Achievements, Prospects in Grodnenskaya Oblast (S.Ts. Kabyak; ZVYAZDA, 5 Feb 80).....	27
Gomel'skaya Oblast Agricultural Plans, Accomplishments (A. Malafeyev; ZVYAZDA, 17 Feb 80).....	28
Agricultural Accomplishments, Plans in Minskaya Oblast (U.A. Mikulich; ZVYAZDA, 20 Jan 80).....	29
AGRO-ECONOMICS AND ORGANIZATION	
Agricultural Specialization, Concentration in Turkmenistan (T.M. Ovcharova; SEL'SKOYE KHOZYAYSTVO TURKMENISTANA, Nov 79).....	31

TILLING AND CROPPING TECHNOLOGY

New Intensive Strain of Spring Wheat Introduced (P.A. Reshetov, N.I. Glukhovtseva; STEPNYYE PROSTORY, Oct 79).....	36
Mineral Fertilizers Applied to Grain Crops (V.G. Podgornov; STEPNYYE PROSTORY, Aug 80).....	39
Modern Equipment Used on Bashkir Sunflower Crop (R.A. Sadykov, S.N. Zaynagabdinov; STEPNYYE PROSTORY, Aug 79).....	46
Measures for Combating Soil Salinity Reviewed (R. Yagmurov, et al; SEL'SKOYE KHOZYAYSTVO TURKMENISTANA, Dec 79).....	51
Improving Soil Salinity Conditions in Behalf of Cotton Crop (A. Khudaykuliyev, Kh. Barayev; TURKMENSKAYA ISKRA, 6 Feb 80).....	57
Irrigation Experiment With Drainage Water Described (D. Sheripov; SEL'SKOYE KHOZYAYSTVO TURKMENISTANA, Dec 79).....	60

REGIONAL DEVELOPMENT

REVIEW OF 1979 AGRICULTURAL PROGRESS, 1980 PROSPECTS IN MOLDAVIA

Kishinev SEL'SKOYE KHOZYAYSTVO MOLDAVII in Russian No 1, Jan 80 pp 4-7

[Article by G. Stepanov, deputy chairman of Moldavian SSR Council of Ministers: "Results and Prospects"]

[Text] The main thing... is everyone's concern for the undeviating growth of labor productivity, efficiency and quality of work, bolstering of economy and carefulness and upgrading of organization and discipline.

From the new year's greeting of the CPSU Central Committee, the Presidium of the USSR Supreme Soviet and the USSR Council of Ministers to the Soviet people

The republic's agricultural workers have completed the fourth year of the five-year plan in an atmosphere of political enthusiasm and fruitful shock labor. It is now possible to sum up certain results and determine the tasks for 1980 while taking into account the demands of the November (1979) Plenum of the CPSU Central Committee and the speech given there by General Secretary of the CPSU Central Committee, Chairman of the Presidium of the USSR Supreme Soviet Comrade L.I. Brezhnev containing a deep and thorough analysis of our economy, the results of the four years of the five-year plan and the plans for the concluding year. Tasks were set--both immediate and long-term, defects and bottlenecks were disclosed, and ways of overcoming them and means for the solution of tasks facing the party and the people were shown.

Comrade L.I. Brezhnev's instructions were taken by our party and people as an urgent program for all work for the future.

Implementing the decisions of the 25th party congress and the July (1978) Plenum of the CPSU Central Committee and guided by the directives and recommendations of Leonid Il'ich Brezhnev made at the time of his visit to Moldavia in January of last year, the republic's farms grew last year a good harvest of the basic agricultural crops, which made it possible to fulfill the plans and socialist commitments for the sale of grain, vegetables, grapes and melon crops to the state. The biggest harvest ever of

sunflower was taken in--something like 20.6 quintals per hectare for the entire sown area; 273,000 tons of oilseeds were sold to the state. The Motherland's granaries received more than a million tons of grain, which is 50,000 tons more than the total volume of purchases. For the first time, there were sold to the state 1,060,000 tons of vegetables and 27,000 tons of melon crops. A total of 1,184,000 tons of grapes were delivered to procurement, the trade network and enterprises of the processing industry.

On the eve of the holiday of Great October, General Secretary of the CPSU Central Committee, Chairman of the Presidium of the USSR Supreme Soviet Comrade L.I. Brezhnev enthusiastically congratulated on these major labor achievements kolkhoz farmers, workers of sovkhozes and interfarm enterprises, machine operators, directors and specialists of farms, scientists, personnel of agricultural and procurement organs, collectives of industrial and transport enterprises, educational institutions, party, soviet and trade-union personnel and all workers of Moldavia.

Leonid Il'ich Brezhnev's warm and cordial greeting was received by agricultural workers and all the Moldavian people with a feeling of boundless joy and deep appreciation. It found a response in the hearts of the workers of Moldavia in the form of an ardent desire to work with new force and was perceived as a challenge to creative accomplishments, as an urgent program of all work for the future.

A significant contribution to the fulfillment of the plan of sales of grain to the state was made by the graingrowers of Chadyr-lungskiy Rayon, who had harvested 41.3 quintals of grain from each hectare, including 38.6 quintals of winter wheat and 54 quintals of corn (from commercial sowings); they sold to the state 56,000 tons of grain versus the 46,000 according to plan. Wonderful master graingrowers work in this rayon. Mechanized detachments headed by Hero of Socialist Labor, deputy to the USSR Supreme Soviet Comrade S.M. Parmakli and winner of USSR State Prize Comrade S.G. Khastov get high yields of grain crops every year; last year they harvested 72 quintals of corn per hectare over large areas. Labor outlays per quintal have been reduced by a factor of 3.7.

Machine operators in the rayon, cultivating sunflowers according to a new industrial technology, obtained on the average 27.5 quintals of oilseeds from each of 2,500 hectares. The machine operators of Glodvanskiy Rayon obtained 26.5 quintals from each of 3,085 hectares.

A major contribution to the fulfillment of the plan of sales of vegetables was made by the vegetable growers of Slobodzeyskiy, Grigoriopol'skiy, Kausanskiy and Novoanenskiy rayons; they sold to the state more than 520,000 tons of vegetables, or almost 50 percent of the total volume of their procurement for the republic.

Remarkable achievements were attained by the grapegrowers of Moldvinprom Agroindustrial Association, who sold to the state 526,000 tons of the amber clusters, which amounts to 46 percent of the total volume of procurements in the public sector. Cities and industrial centers of the country received in fresh form 650,000 tons of fruits, vegetables and grapes.

The achieved successes are the result of the high level of skill of the agricultural workers, who have been systematically implementing a program of specialization and concentration of agricultural production on the basis of interfarm cooperation and agroindustrial integration, determined introduction of progressive technologies, new forms of labor organization and the purposeful organizational and political work of party, soviet, trade-union and komsomol organizations, as well as much help from industrial and transport enterprises and educational institutions.

An important element in the integration occurring in agriculture was the creation in rayons of interfarm associations for mechanization and electrification of agriculture production, which made it possible to employ industrial technologies in the cultivation of agricultural crops in large interfarm rotations of crops, to raise labor productivity and to increase production output.

Concentration and specialization is being broadly developed of one of the leading sectors of the agroindustrial complex of the republic--fruit cultivation. Just in the four years of the five-year plan about 15,000 hectares were planted of intensive and superintensive orchards, which constitute 42 percent of all plantings in the public sector.

High and stable yields are being produced every year by the horticulturists of Ungenskiy and Kriulyanskiy rayons, sovkhozes imeni Kotovskiy of Glodyanskiy Rayon and Pobeda of Brichanskiy Rayon, kolkhozes 50 Let Oktyabrya of Oknitskiy Rayon and imeni Zhdanov of Ryshkanskiy Rayon and the Tsvetushchaya Moldaviya Sovkhoz-Plant of Strashenskiy Rayon. In 1979 these farms obtained more than 230 quintals of fruit from each hectare. Many brigades and links had even higher indicators.

The processes of concentration and specialization have encompassed on a particularly broad scale one of the chief sectors of the republic's agroindustrial complex--animal husbandry, determining to a significant degree the efficiency of the agrarian sector as a whole and the successful work of the meat and dairy industry. Last year, interfarm animal-husbandry associations produced about 66 percent of the meat of the entire kolkhoz-cooperative sector and 77 percent of the eggs and reared 80 percent of the calves and young cows that had not yet calved.

The work being done in concentration and specialization of production of animal-husbandry products has made it possible to boost productivity of livestock and poultry, to increase the production of meat, milk, eggs and

wool, to reduce their production cost and to successfully fulfill in 1979 the plan of their sales to the state. The plan for delivery of animal-husbandry products to the all-union fund has also been fulfilled.

I would like to say some kind words in regard to the animal-husbandry workers of Brichanskiy, Kriulyanskiy, Slobodzeyskiy and Kagul'skiy rayons, who achieved remarkable results in the production and sale to the state of meat, milk and other animal-husbandry products.

Moldavia has many animal-husbandry workers with a high level of vocational training who have mastered to perfection progressive industrial technologies. They include Hero of Socialist labor, winner of USSR State Prize N.T. Mirovskiy from Lazovskoye, M.D. Uzun from Komratskoye, M.N. Khariton from Kagul'skoye and A.O. Kolesnik from Rybnitskoye associations of Kolkhoz-zhivprom and many others who produce yearly 250-300 tons of gross added weight to pigs, ensuring 550-650 grams of weight increase daily.

The republic has produced a whole pleiad of masters of high milking output; 345 operators fulfilled ahead of schedule the five-year plan of yield of milk. They include master of machine milking of Mayak Kolkhoz of Oknitskiy Rayon A.V. Moskalyuk, operators of XXIII S"yezd KPSS Kolkhoz of Lazovskiy Rayon Ye.F. Smyntyne and A.L. Samoil from Pravda Kolkhoz of Novoanenskiy Rayon and others.

Last year record milk yields were obtained by milkmaids V.T. Lutenko from Moldov Kolkhoz of Suvorovskiy Rayon, Ye.D. Darchuk from Put' k Kommunizmu Sovkhoz of Yedeninetskiy Rayon, M.A. Kitik from XIX S"yezd KPSS Kolkhoz of Brichanskiy Rayon and others who on the average obtained per cow 6,000 or more kilograms of milk.

At the same time, analysis of the operation of many rayons and farms in the past years of the five-year plan attest to the fact that existing reserves are not being sufficiently used, especially in the production of sugar beet, tobacco and fruits, in connection with which a serious lag has been allowed to occur in recent years in regard to the fulfillment of the plan of production and procurement of these crops. The reasons for this are many: violation of agrotechnology, nonobservance of optimum time of sowing (planting), inadequate care of plants, protracted harvesting, allowing losses and spoilage in the course of harvesting, transportation, storage and sorting. All this is the consequence of inadequate responsibility on the part of directors and specialists of farms and enterprises for the entrusted task.

Many farms counting on getting big yields of industrial crops unjustifiably reduce their sowing (planting) areas. Last years kolkhozes failed to plant 8,800 hectares of sugar beet, 10,500 hectares of sunflower and 7,700 hectares of tobacco, in connection with which the state experienced a shortfall in obtaining a significant number of products. Insufficient sowing took place on kolkhozes of Dondyushanskiy, Yedinetskiy, Oknitskiy, Komratskiy, Ryshkanskiy and Chimishliyskiy rayons. State and planning discipline

is not being sufficiently observed here. The November (1979) Plenum of the CPSU Central Committee placed special emphasis on the necessity for further strengthening discipline at all levels and in all sectors of work. Leonid Il'ich Brezhnev in a speech at the Plenum noted that "... The tasks facing us require in particular the strengthening and tightening of control over the fulfillment of plan targets and adopted decisions... It is necessary to react effectively and pointedly to occurrences of mismanagement and violations of set plans, rules and norms."

This year there will be introduced into production in the republic progressive technologies for the cultivation of corn for grain on an area of 345,000 hectares, sunflower--on 40,000 hectares, sugar beet--on 10,000 hectares, soybeans--on 4,500 hectares and tomatoes--on 15,000 hectares. These technologies include the special-purpose use of mineral fertilizers, herbicides and equipment. It is important for all procedures to be carried out in accordance with the developed progressive technologies ensuring a yield of corn of no less than 45 quintals, sunflower--30 quintals, sugar beet--350-500 quintals, soybeans--25 quintals and tomatoes--400 quintals.

A few words on tobacco production. Leading farms of the republic obtain on a yearly basis from each hectare of planting a profit on the order of 1,800-2,000 and more rubles, ensuring a high profitability. But there are farms where in recent years less attention has been given to this sector and in place of profits they have been experiencing losses and from year to year have not been fulfilling plans of sale of raw tobacco to the state.

The attitude toward this crop should be changed, and tobacco cultivation must be undertaken in a real way so that in 1980 it would be possible to obtain from each hectare 17 quintals of high-quality tobacco leaf and to produce 120,000 tons of tobacco.

In November-December of last year, there were held a republic rally of farmers, a conference of animal-husbandry workers and a meeting of the party-economic aktiv for fruit cultivation at which the state of affairs was judged from all sides. The participants of the rally, conference and meeting adopted socialist commitments and an appeal. Every rural worker should be acquainted with these documents. Everything should be done to ensure the fulfillment of adopted commitments by each farm, brigade, link and all complexes, animal-husbandry farms and animal-husbandry workers.

This year grain farmers are to produce 3,710,000 tons of grain, to take in from each hectare 39 quintals of grain crops, including winter wheat--38 quintals. On irrigated land the figures are 60 quintals of wheat and 80 quintals of corn kernels. The republic's farmers have pledged to increase sunflower yield to 21 quintals per hectare and to produce 345,000 tons of oilseeds, to obtain 343 quintals of sugar beet and to ensure a gross root yield of 4,150,000 tons.

It is planned to produce on each hectare of fruit-bearing plantings of vineyards 70 quintals of amber clusters and to produce 1,370,000 tons of

grapes, to collect no less than 190 quintals of vegetables per hectares and to produce 1,360,000 tons. A number of rayons and many farms adopted even bigger commitments.

The republic's horticulturists will endeavor to obtain no less than 110 quintals of fruits from each hectare and to produce 1,210,000 tons of fruits and berries. The adopted decree of the CPSU Central Committee and the USSR Council of Ministers "On Measures for Further Increasing Production and Procurement of Fruits in Moldavian SSR" provides for accelerated development and increased efficiency of fruitgrowing in the republic, a significant strengthening of the material-technical base of the sector, complete outfitting of new complexes with machines for the industrialization of production of fruit and berry products, irrigation and chemicalization, introduction of modern intensive and superintensive technologies and the creation of large interfarm and agroindustrial fruit-growing associations.

The aforesaid decree confirms with new force the tremendous concern of the party and the government for the social-economic development of the republic and the systematic realization of the policy of accelerated development of agricultural production to raise the well-being of the Soviet people and to satisfy the growing requirements for food products.

The decree makes provision to increase the gross production of fruits and berries in the republic in 1985 to 1.8 million tons and in 1990 to 3 million tons and sales to the state in 1985 to 1.5 million tons and deliveries to the all-union fund of fruits to 650,000 tons.

During the 11th Five-Year Plan it is planned to plant new orchards of the industrial type on an area of 65,000 hectares through curtailment of areas with low-productive orchards and the use of new land. The area of orchards in the public sector by 1985 will reach 180,000 hectares.

The task is, in addition to the further creation of large industrial interfarm orchards, to employ for orchards sloping land, gullies, low lying ground in the midst of vineyards. It is very important at this time to launch a mass movement to plant fruit trees on all private plots, streets and wide roads.

Animal-husbandry workers are faced with a major task. Leonid Il'ich Brezhnev said in a speech at the November (1979) Plenum of the CPSU Central in referring to the problem of supplying the population with foodstuffs, especially meat: "Provision of an uninterrupted supply and production of high-quality food products in sufficiency and wide assortment constitutes one of the most important tasks stemming from the policy of the party to raise the well-being of workers. The very first obligation of directors of agricultural and soviet organs, farms, specialists and all animal-husbandry workers is to fulfill the decision of the Plenum and to significantly increase meat production.

Animal-husbandry workers of the republic have a task for 1980 to produce meat amounting to 406,000 tons in live weight and to sell 320,000 tons to the state, milk--1,240,000 and 860,000 tons, respectively, eggs--900 million and 570 million each, and wool--2,500 and 1,900 tons. The solution of the tasks planned for the concluding year of the five-year plan will require the mobilization of all efforts by kolkhozes, sovkhoses, sovkhoses-plants, interfarm associations and enterprises and all agricultural workers.

At the present time, the most responsible period for animal-husbandry workers, they must carry out wintering of livestock in an organized manner. It is necessary to take all steps so as not only to preserve the number of cattle but also to obtain the maximum growth of productivity and to ensure rational and effective utilization of each kilogram of feed. Concern should also be taken for creation of the necessary conditions for the work and rest of animal-husbandry workers, including the wide-scale use of measures of moral and material encouragement.

Winter is not only a period of strenuous work but also a time of mass study by animal-husbandry workers, fieldworkers and machine operators. It is necessary for each worker of a complex or animal-husbandry farm and for each machine operator to study advanced techniques and methods of labor and to carry out high-quality repair of equipment.

Under present-day conditions, the quality of agricultural products is of special importance. And quality primarily depends on timely harvesting of the crop, drying, sorting and cleaning. This especially applies to vegetable, fruit and berry products, which cannot be stored for an extended period. Here uninterrupted, coordinated work of all sections is required--from field or animal-husbandry farm to the buyer. It is therefore very important to increase the responsibility of personnel of transport, processing industry and trade. The construction of kolkhoz and sovkhos warehouses and storage facilities should be expanded.

The field and farm workers of Moldavia clearly realize that there is much work ahead for them. And it cannot be called easy. They are full of decision to concentrate their efforts on unresolved problems in order to raise lagging sectors and parts of agricultural production.

There is no doubt that the agricultural workers of Moldavia, having launched socialist competition on a broad scale, will do everything possible to fulfill plans and socialist commitments for production and sale to the state farming and animal-husbandry products in the final year of the Tenth Five-Year Plan and to mark in a worthy manner the 110th anniversary of V.I. Lenin's birth and the 26th CPSU Congress and to transform 1980 into a year of shock work, Leninist work.

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REGIONAL DEVELOPMENT

BETTER FEED HELD KEY TO INCREASED ANIMAL PRODUCTS

Minsk SEL'SKOYE KHOZYAYSTVO BELORUSSII in Russian No 1, Jan 80 pp 4-5

[Article: "Manage Efficiently"]

[Text] The last year of the Tenth Five-Year Plan has come into its own. This year should bring workers in the Belorussian countryside new labor victories in the campaign to implement the decisions of the July 1978 Plenum of the CPSU Central Committee, to strengthen and develop the materials and equipment base, and improve the efficiency of all branches of agricultural production.

As the decree of the 20th Plenum of the Central Committee of the Communist Party of Belorussia points out, workers in the Belorussian countryside must do everything necessary in 1980 to obtain yields of 32 quintals of grain cereal crops, 190-200 quintals of potatoes, 270 quintals of sugar beets, 5.4 quintals of flax fiber, and 190-200 quintals of vegetables per hectare. They must achieve a gross production of up to 9-10 million tons of grain, 7.7 million tons of potatoes, 1.37 million tons of sugar beets, 126,000 tons of flax fiber, and 576,000 tons of vegetables.

In meeting the goals of the current year each farm and rayon must without fail search for additional resources for eliminating indebtednesses for certain types of products. And the state has many debtors. In 4 years of the five-year plan the republic had a shortfall of 226,000 tons of grain, 116,000 tons of flax fiber, 267,000 tons of vegetables, and 189,000 tons of cattle and poultry.

Making up the shortage in products and successfully meeting the plan for the Tenth Five-Year Plan is a matter of honor for each kolkhoz and sovkhos and every brigade, farm, and rural worker. We must actively and purposefully strive to implement this task, without losing a single day. First of all, it is necessary to analyze deeply and thoroughly the results of the work of kolkhozes and sovkhoses during the previous period and the work of all the teams in the agro-industrial complex and management of

agricultural production and to uncover the true reasons for the shortcomings and the blunders permitted during the course of meeting plans and obligations. This should allow all our cadres from top to bottom to draw the necessary and correct conclusions from the lessons of previous practice and especially the year just past and to determine practicable ways, methods, and means of achieving a higher level of management.

In his report to the 20th Plenum of the Central Committee of the Communist Party of Belorussia P. M. Masherov, candidate member of the Politburo of the CPSU Central Committee and first secretary of the Central Committee of the Communist Party of Belorussia, pointed out that our cadres learned quite a lot last year. He brought to light the strong points and also fully exposed the weak facets of the work of party committees and organizations, soviet and agricultural organs, and kolkhoz and sovkhoz directors and specialists. He presented a wealth of material on further improving the style and methods of our work and organizational, mass political, and economic activities. He made it possible to clearly represent and perceive in concrete deeds cadres at all levels and the ability to mobilize people's strength, will, and energy and to apply them in solving the exceptionally complex and at the same time extremely important problems.

Practice has shown that the effect of adverse weather factors and unfavorable environmental conditions is considerably less in places where there is a high overall level of agriculture, where purposeful work is carried on systematically to continuously improve soil fertility and to apply large amounts of organic fertilizers, where all technological operations are conducted well and with strict adherence to the best time periods for soil preparation, sowing, tending the plants, and harvesting the agricultural crops.

The example of the grain growers on the Usnezhitskiy Kolkhoz in Pinskiy Rayon is a model of work actually on the level of modern requirements. There they have harvested a high yield -- an average of 44.8 quintals of grain per hectare. The following kolkhozes obtained over 40 quintals of grain: Peramoga in Zhickovichskiy Rayon, Progress in Grodnenskiy Rayon, imeni Shchors in Novogrudskiy Rayon, imeni Gastell in Minskiy Rayon, and the Lyubanskaya Experimental Base in Lyubanskiy Rayon. A total of 47 farms harvested over 30 quintals, and 104 farms harvested from 25 to 30 quintals of grain per hectare. An average of 22 to 25 quintals of grain was obtained in Grodnenskiy, Kobrinskiy, Stolinskiy, and Korelichskiy rayons.

The experience of these and other farms convinces us once again that an increase in the production of quality organic fertilizers and an improvement in the overall level of soil cultivation are the strategic course of all the work of our cadres in guaranteeing a high level of intensification of agriculture in general and grain farming in particular.

We must also point out the complicated practice of applying organic fertilizers. Only every third hectare of barley and every tenth hectare of

winter rye are treated with them. We must make it a rule to apply about 40 percent of the year's total organic fertilizers to the grain crop as early as this year's spring field work. On the whole, each hectare of the spring sowing must receive at least 21 tons of high quality composts.

The time has come to convert the allocation of mineral fertilizers for kol-khozes and sovkhoses and their utilization on farms to a very strict scientific basis and to guarantee optimum doses of nutrients in the mineral fertilizers applied, taking into account the mechanical composition and degree of cultivation of the soils, the quantity of organic fertilizers, and varieties of crops being raised and the yield expected.

Finally, it is necessary to completely eliminate the bad practice of a number of farms of applying increased norms of nitrogen to grain crops. It is time that agricultural specialists understand that this inflicts considerable damage to the cause, since in the years with increased humidity such plantings lodge severely and produce undersized grain and in dry years they burn most of all.

The return from mineral fertilizers is the criterion for the efficiency of utilization not only of mineral fertilizers but also all other crop-forming factors. Without exception all agrotechnical methods, time schedules, and the quality of operations being carried out are perceived through it as if through a prism. This is a generalizing, integral indicator of the level not only of grain raising, but also of crop production as a whole. Therefore, the task is one of persistently and purposefully striving to improve the effectiveness of fertilizers applied to all agricultural crops and through their return to control and raise the level of all organizational and technological measures being conducted to increase the yield.

It is also necessary to study more thoroughly problems concerning the structure of the area sown, taking into consideration soil differences and farm potentials. The acute necessity for implementing these measures is caused by the fact that when there is a shortage of moisture on huge expanses of sandy and sandy loam soils having underlying sand, there is a wide range in the yield of various types of grain crops. The same thing is also observed on heavy loamy soils having a hilly terrain and complex field configuration. All this obliges agricultural organs to engage more actively in eliminating such variegation, directing special attention to introducing new strains of intensive-type crops, strictly adhering to strain changing, and improving considerably the quality of all seed material, along with solving other problems.

We must strive more persistently to increase the effectiveness of technological means in field operations. Experience has shown that complex mechanized detachments and teams must become the main organizational form of utilization of the machine-tractor pool on all farms and at all stages of conducting agricultural operations.

Constant concern must be shown for improving feed production. Agricultural and forest lands in the republic are fully able in any weather conditions to provide a sufficient amount of coarse and succulent fodder both for public animal husbandry and for cattle kept for the private use of citizens and even to establish a fodder reserve in good years. The prime goal is to realize these potentials.

This year the needs of public animal husbandry alone require the production of not less than 3.3 million tons of hay, 10 million tons of haylage, 4.2 million tons of root crops, and 400,000 tons of desiccated feeds. Moreover, it is necessary to set aside for this purpose about 4 million tons of locally produced forage grain and 2.5 million tons of potatoes. Keeping in mind that in essence we have no possibility of expanding the area sown to fodder crops, then we can accumulate this quantity of forage only by significantly increasing their yield.

We must do everything possible to obtain from each fodder hectare an average yield of 35 to 40 quintals of fodder units on plowland and 25 to 30 quintals from natural lands. It is necessary to develop and propose to kolkhozes and sovkhoses a fodder field structure which will make it possible to obtain the greatest amount of forage per unit of land areas and best conform to the specialization of animal husbandry. Highly intensive type crops, which make it possible under any condition to obtain yields with a high content of protein, carbohydrates, and other nutrients, must predominate among them.

The most important task in the struggle to successfully meet the plans of the Tenth Five-Year Plan is to successfully carry out the wintering of cattle and to obtain a maximum amount of animal husbandry products during the stall period. Essentially there is only one way to achieve this -- to manage the best fodder resources wisely, intelligently, economically prudently and efficiently.

As was pointed out at the 20th Plenum of the Central Committee of the Communist Party of Belorussia, there must be no liberalism in this important matter. Each incident of poor management and mismanagement in the organization of feeding and keeping animals involving a reduction in output and losses of young animals should be criticized severely. In so doing, with consideration for extremely complicated situations, measures must also be appropriate, up to replacing those workers who prove to be incapable under complicated conditions of fully meeting the goals set for increasing the output and procurements of animal husbandry products.

In a word, now as never before there is a need for iron discipline. We must increase immeasurably the responsibility of cadres on all teams and at all ranks for the state of affairs in animal husbandry. Extraordinary measures should be implemented everywhere. It is necessary to eliminate situations in which the majority of average and small farms, which produce the main part of animal husbandry products, do not have feed shops, feed

preparation plants, and the simplest feed yards and forage is used in an unprepared form. The solution of this problem is feasible, possible, and practicable for each kolkhoz and sovkhoz. It requires only a zealous manager and a careful, disciplined worker.

With the proper organization of affairs on farms there is every possibility of increasing the efficiency of feeds 20 to 25 percent. This is exactly the level which makes it possible to guarantee the necessary productivity of the cattle in the stall period. So the heating up of the campaign for every kilogram of animal husbandry product must increase literally every day. Only a high degree of organization, efficiency, and concentration, which are extremely necessary now, will promote decisively the successful meeting of plans for this year and the five-year plan as a whole. We must do everything to see that in the last year the republic kolkhozes and sovkhozes produce an average of 473 quintals of milk and 118 quintals of meat per 100 hectares of agricultural land and increase the 1979 level of procurement of milk 7 percent and cattle and poultry 8 percent. The increases cited must be considered minimal in view of the existing indebtedness from the previous period both for the production and sale to the state of animal husbandry products, as well as the need to satisfy more fully public demands for food products.

The meeting of the goals facing us is possible only if each farm and each sub-farm at every stage of the work to achieve this goal exerts considerably more effort and if the results are considerably greater than heretofore. First of all it is necessary to put an end to the chronic lag in milk production.

We must solve this problem, taking into account the concrete potentials of each kolkhoz and sovkhoz. Analysis shows that not only is the productivity of the dairy herd not increasing, but its numbers are increasing extremely slowly. This cannot continue any longer. We must work more persistently and energetically to increase the dairy herd's productivity. At the same time it is necessary to utilize more actively such opportunities for increasing milk production as increasing the number of cows. Everything should be done to see that their density per 100 hectares of agricultural land is increased annually a minimum of one head and by the end of the coming five-year plan reaches a republic average of 25 cows, or 35 head counting privately owned cattle.

More attention must be paid to the development of the meat branches of public animal husbandry. The main thing is to achieve a basic turn toward their intensification. This requires a different, qualitatively new approach to the organization of feeding animals; it is especially important to observe technological discipline strictly in organizing livestock feeding. Therefore, it is necessary universally to come to a thorough understanding of the state of affairs in the republic meat shop and to solve efficiently all organizational, economic, and other problems concerning a

substantial improvement in its work, thereby creating the necessary prerequisites for implementing the plans of the coming year and the five-year plan as a whole.

We should also utilize more fully the potentials present on citizens private plots. The task comes down to seeing that we buy from the public not less than 600,000 tons of milk, or over 600 kilograms per cow this very year, 700,000 to 750,000 tons in 1981, and 900,000 to one million tons by the end of the 11th Five-Year Plan. Party, soviet, and agricultural organs, primary party organizations, and kolkhoz and sovkhos directors must take measures so as not only to maintain the number of cows kept by the public, but also to bring their number up to one million head. Citizens in the republic currently own 960,000 cows.

The fact that the number of cows owned by the public is declining with each year can not help but cause concern. The main reason for this is the difficulties which livestock owners experience in procuring feed and providing pastures for them. This is not normal. The situation must be rectified. We should make it a rule to guarantee the allocation of coarse fodder to citizens keeping livestock according to the same norms used for the public herd, including here the corresponding indicators in the five-year plan and the annual plans. Of course, the above applies to the stall period. But it must not be limited to this. The privately owned livestock must be guaranteed feed the year round. Consequently, there is a special need to establish highly productive pastures.

The pledge of success in animal husbandry is improving work with people who work directly on the farms, perfecting the organization of their labor, and effectively utilizing all measures of material and moral incentive. The Decree of the CPSU Central Committee, USSR Council of Ministers, ACCTU, and Central Committee of the All-Union Komsomol "On Developing All-Union Socialist Competition Among Animal Husbandry Workers to Increase the Productivity and Procurement of Animal Husbandry Products During the Winter of 1979-1980" was aimed at precisely this. Party, trade union, and Komsomol organizations on kolkhozes and sovkhoses, soviet and agricultural organs, and all rural workers must center their attention on the implementation of this decree.

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REGIONAL DEVELOPMENT

SHORTCOMINGS IN MOLDAVIAN LIVESTOCK PRODUCTION

Kishinev SOVETSKAYA MOLDAVIYA in Russian 23 Dec 79 pp 1-2

[Article: "The Patriotic Duty of Livestock Farmers"]

[Excerpts] The republic meeting of workers of the livestock industry took place on 22 December in the capital palace of Oktombriye. Invited to the meeting were leading production workers, directors of complexes and farms, zootechnologists, veterinary workers, directors of kolkhozes, sovkhozes and sovkhoz plants, chairmen of rayon Kolkhozhivprom [Kolkhoz livestock industry] associations and associations on the production and processing of feeds, deputy directors of rayon associations of Goskomsel'khoztekhnika [State committee of the agricultural equipment association], general directors of scientific-production and agroindustrial associations, chairmen of rayon kolkhoz soviets, deputy chairmen of rayon executive committees, secretaries of party rayon committees and directors and specialists of ministries and departments.

The meeting was opened by S. K. Grossu, Chairman of the Council of Ministers of the Moldavian SSR.

With great enthusiasm the participants in the meeting elected an honorary presidium consisting of the Politburo of the Leninist CPSU Central Committee headed by the Secretary General of the CPSU Central Committee and Chairman of the Presidium of the USSR Supreme Soviet, Comrade L. I. Brezhnev.

The deputy chairman of the Council of Ministers of the Moldavian SSR, G. A. Stepanov, presented a speech entitled, "On the Results of the Work of Livestock Farmers in the Republic in 1979 and on the Tasks Arising Out of the Resolution of the CPSU Central Committee, USSR Council of Ministers, AUCCTU [All-Union Central Trade Union Council], and the Central Committee of the VLKSM [Komsomol], 'On Beginning All-Union Socialist Competition for Livestock Workers to Increase Production and the Procurement of Livestock Products During the Winter Period 1979-1980'."

L. I. Brezhnev said that in actively implementing the decisions of the 25th party congress and the July 1978 Plenum of the CPSU Central Committee and in

using the recommendations and directives of Comrade L. I. Brezhnev expressed by him while he was in Moldavia in January of the current year, the agricultural workers of the republic raised a good harvest and fulfilled their socialist obligations regarding the sale of grain, grapes and vegetable-melon crops to the state. The Secretary General of the CPSU Central Committee, Comrade L. I. Brezhnev, warmly congratulated the republic's workers for this victory.

The agricultural workers of Moldavia accepted the decisions of the November 1979 Plenum of the CPSU Central Committee and the second session of the USSR Supreme Soviet as a battle plan of action. In completing the fulfillment of the plans and socialist obligations of the fourth year of the five-year plan, they are developing the necessary foundation for the realization of 1980 goals. Following the example of farmers, the livestock farmers of the republic have dealt successfully with four-year plans for the sale of milk, eggs and wool. They are making efforts to conclude the overwintering of livestock in an organized manner.

The rapid development of the processes of production concentration and specialization on the basis of interenterprise cooperation and agroindustrial integration and the creation of large enterprises, complexes and associations of the industrial type are securing the rapid transition of agriculture to an industrial base and its constant improvement in effectiveness. These processes are proceeding on an especially large scale in one of the main branches of the agroindustrial complex of the republic--in livestock farming. Thus, today interfarm livestock-raising enterprises of the kolkhoz-cooperative sector are producing 66 percent of the meat, 77 percent of the eggs and 80 percent of the heifers. One operator in a complex produces 46,000 rubles worth of production per year.

The party and state exhibit constant concern for the development of livestock farming as the most complex and important branch of the national economy. This is also attested to by the recent resolution of the CPSU Central Committee, the USSR Council of Ministers, the AUCCTU and the Komsomol Central Committee, "On Beginning All-Union Socialist Competition for Livestock Workers to Increase Production and the Procurement of Livestock Products During the Winter Period 1979-1980."

The status of this branch in the republic and the goals for future development in 1979-1980 were analyzed and determined in April of this year at the plenary session of the Central Committee of the Moldavian CP.

Almost two-thirds of the gross production of the branch comes from meat livestock farming in our republic. During the years of the 10th Five-Year Plan meat production increased by 29 percent, including production on an industrial basis--by 45 percent. An important place in the development of the meat shop belongs to hog farming, the proportion of which in total meat production volume is 50 percent. This year the state will be sold over 132,000 tons of pork, or 24,000 tons more than in 1975. The procurement volume for this period will increase by 22 percent. The size of the herd and of offspring will also increase considerably.

Despite the difficulties with feed, many collective enterprises on raising and fattening hogs have shown that with the efficient utilization of existing capacities and feeds it is possible to achieve good results even under difficult conditions.

At the same time, the possibilities for the development of hog farming are not being utilized fully. In a number of complexes, especially on farms, weight gain is still low, feed and labor expenditures per unit of production are high and costs of production are high. This has a negative effect on the economies of enterprises and results in the non-fulfillment of production plans for the sale of meat to the state. The use level of the offspring herd of swine is still low. In the republic on the average the number of farrows per basic sow does not exceed 1.6-1.7 annually instead of the 2.2 planned by technology. The number of piglets per farrow is 7-8 instead of 10-12 and the average daily weight gain of hogs being fattened is 400-450 grams instead of 550-600. Per quintal of weight gain 7-8 and more quintals of feed units, 5-7 man-hours are expended, which exceeds norms established for industrial hog farming by 30-40 percent. The cost of products is 1.5 times higher than normative requirements. Only 75-80 kilograms of meat are sold per head of swine accounted for at the beginning of the year.

For the above reasons for 4 years of the five-year plan the interfarm associations and enterprises, kolkhozes and state farms will not deliver a significant quantity of pork to the state. The largest debts have been incurred by the enterprises of Vulkaneshtskiy, Dondyushanskiy, Floreshtskiy, Bayorovski, Kotovski, Grigoriopol'skiy and Rezinskiy rayons.

The situation has not improved much in the current year. The annual plan for the sale of pork to the state has been fulfilled by 75 percent in 11 months of the year. Thirteen rayons allowed drops in production and procurement as compared to last year. These include Dubossarskiy, Nisporenskiy and Chadyr-Lungskiy rayons, which decreased production by 14-27 percent. The livestock farmers of Kotovski Rayon fulfilled the plan for the procurement of swine by only 52 percent; Glodyanskiy, Strashenskiy, Sorokskiy and Dubossarskiy--by 58-60 percent.

In Kantemirskiy, Suvorovski and a number of other rayons the production capacities of specialized enterprises for the raising and fattening of hogs are not being utilized satisfactorily. In Rezinskiy, Grigoriopol'skiy and Floreshtskiy rayons the technology and capacities of complexes with closed cycles are being assimilated slowly.

What the consequences of poor organization in industrial hog farming are can be seen from the examples of Komratskiy and Kaushanskiy rayons, which have almost identical lands, economic conditions, reproductive capacities and capacities for raising and fattening hogs. During 11 months the average daily weight gain in hogs being fattened in the Komratskiy complex was 470 grams; in Kaushanskiy--284 grams. For each quintal of weight gain 6.1 and 8.5 quintals of feed units and 10 and 15 man-hours were

expended respectively. The cost of 1 quintal of weight gain was 97 and 143 rubles. As of 1 December the Komratskiy Complex produced 4,300 tons of pork or 91 percent of the annual plan; the Kaushanskiy--1,800 tons or 50 percent.

Under conditions of scientific-technical progress the significance of selection and breeding work grows. In the area of hog farming the tasks of intensifying the work to develop new lines and hybrids, to organize the production of pedigree animals and to supply complexes with herds have been assigned to the Progress Scientific-Production Association. A specialized network of enterprises producing pedigree hogs has been formed within the association, thereby enabling us to solve the problem of supplying pedigree piglets to hog complexes and farms. However, the program of hybridization of hogs that was developed by the association's scientists, although it is a principally new effective solution to the problems of breeding work under conditions of production concentration and specialization on the basis of industrial technology, is still experimental in nature and is being introduced into production slowly. It is for this reason that hog-raising complexes are poorly supplied with sires which have been checked for the quality of their offspring. This results in the fact that a significant portion of the herd is written off by purchasing enterprises ahead of schedule. As a consequence, the capacities of interenterprise complexes are used by only 85-90 percent with the herd of sows. The scientists of the Progress Association must draw serious conclusions from this and radically restructure their work.

In the republic each year measures are taken to increase meat resources by developing the most rapidly-maturing branches--hog farming and poultry farming. Each rayon is given specific assignments on the production of pork, the production of piglets, their sale to the population and other indicators. Nevertheless, many rayons do not secure their fulfillment. Thus, in 11 months the task to produce new piglets was fulfilled by the enterprises of the republic by 92 percent, and in Kaushanskiy and Suvorovskiy rayons--by 88 percent and by Kalarashskiy--by 79 percent.

In order to eliminate this shortcoming and to secure the complete utilization of the capacities of complexes and farms, in 1980 the rayon will be given a greater goal for producing more new piglets. It is necessary for specialists already today to think through all the problems related to conducting winter-spring farrows and to creating the conditions for the maximal preservation and normal development of the offspring.

In solving the problem of increasing meat production, the speaker said, a no less important role will be played by livestock farming, which produces 40 percent of the total volume of meat in the republic. In this branch as well great measures have been realized to make the transition to an industrial base. Satisfying changes took place after the start of operations of large complexes to raise and fatten livestock in Yedinetskiy, Drokiyevskiy, Faleshtskiy, Slobodzeyevskiy and other rayons. This was also the result of improved technology in livestock upkeep and of strengthening

the feed base. In the republic at the current time there are 34 complexes for beef production with a total capacity of about 200,000 livestock places simultaneously.

The extensive introduction of industrial technology has enabled us to increase beef production primarily not through the growth of the herd but through raising the weight of the livestock that is delivered for slaughter. Between 1975 and 1979 the size of the herd increased by 4 percent and beef production increased by over 15 percent, and in interenterprise complexes--by 69 percent. The Slobodzeyskiy, Orgeyevskiy and Dubossarskiy interfarm complexes increased beef production by a factor of 1.8-2. The average live weight of cattle sold in 1978 reached 381 kilograms, and this year it will exceed 400 kilograms.

At the present time the republic is practically supplied with production capacities for the intensive raising and fattening of all calves that need to be fattened. Nevertheless, in a number of complexes full assimilation has not yet been achieved and for this reason only 127,000 head are fattened on an industrial basis, i.e. the existing capacities are being utilized by only 74 percent.

Then Comrade Stepanov discussed the questions of preventing diseases and avoiding cattle plague in industrial complexes. In cattle and poultry plague spreads, he said, because some directors and specialists ignore the elementary requirements of sanitation and zoohygiene regarding the care, upkeep and feeding of animals and because the veterinary service is not persistent enough in its observations.

During the 10th Five-Year Plan the farm workers of the republic secured the continued development of dairy livestock farming, continued the speaker. As of 1 December the dairy herd increased by 15,000 head in comparison to the same period last year, and the productivity of cows increased by 32 kilograms of milk. According to preliminary data, each cow will produce more than 3,100 kilograms of milk annually. The masters of the dairy shop in Moldavia have not yet reached this type of indicator. This year gross milk production in the republic will increase by 62,000 tons, or by 8 percent as compared with last year. This secures the fulfillment of the plan for its sale to the state.

At the same time in a number of enterprises and rayons dairy livestock farming is being managed badly. Many directors of kolkhozes, sovkhoz-plants and soykhozes do not personally become involved in this important branch. This is one of the reasons that 10 rayons did not fulfill their plans, including Bulkaneshtskiy, Grigoriopol'skiy, Kriulyanskiy and Chimishliyskiy--by 5-10 percent and Chadyr-Lungskiy--by 15 percent. The situation is especially bad in Floreshtskiy Rayon, where the enterprises underproduced over 13,000 tons of products in 4 years of the five-year plan and 8,000 tons of products for the sales plan.

Last year the Central Committee of the Moldavian CP and the Council of Ministers of the Moldavian SSR passed a resolution that foresaw an increase in the herd of cows by the end of the current year to 332,000 in the public sector. However, as of 1 December there were only 323,000 cows. At fault in this lag are Brichanskiy, Oknitskiy, Rybnitskiy, Slobodzeyevskiy, Kalarashskiy, Vulkaneshtskiy, Grigoriopol'skiy, Komratskiy and Teleneshtskiy rayons. In the last of these during the last 4 years the herd of cows remained on the same level in some enterprises and even dropped in others.

In the republic a good base has been created for the reproduction of the brood herd. At the present time about 140,000 heifers are concentrated on 35 functioning interfarm complexes. Their delivery to enterprises will soon secure the replacement of about half of the dairy herd.

At the same time, some rayons are not fully utilizing the advantages of these specialized enterprises. At the Chimishliyskiy, Sorokskiy and some other complexes there are constant violations in the technology of the acquisition and raising of calves. The enterprises organize feed procurement poorly. As a result the production program is not fulfilled and the dairy farms of the aforementioned rayons produce low-quality heifers.

Frequently it occurs that a good heifer is subject to bad conditions on a farm or falls into the hands of a careless milkmaid and is written off after calving due to low productivity. In order to eliminate this it is necessary to change to a more progressive form of reproduction of the dairy herd by creating specialized departments and shops in each rayon to prepare cows for calving and to milk them.

During the 11th Five-Year Plan the livestock farmers of Moldavia must increase the average milk yield per cow to 4,000 kilograms. This year the Central Committee of the Moldavian CP and the republic's council of ministers passed a resolution about the creation of a single service for managing selection-breeding work and for the reproduction of the herd in livestock farming and sheep farming and a selection-breeding center within the Zarya NPO [Scientific-production association]. This should play an important role in accelerating the growth of productivity of the dairy herd and in increasing the effectiveness of the branch and the quality of the milk.

Further Comrade Stepanov discussed in detail the problems of poultry farming, which was among the first in the republic to become industrialized. As of 1 December poultry factories and kolkhoz and sovkhos farms produced 521 million eggs and 30,000 tons of meat in live weight, or 10 percent more than last year.

At the same time the possibilities for this branch are not being utilized fully by far. In connection with this the program for the development of the poultry industry in 1976-1979 was not fulfilled. Because of gross

violations of production technology and veterinary-sanitary rules in 11 months of the current year the state of preservation of calves in Talmazskaya Broiler Factory was 56 percent; in the Rybnitskaya--54 percent. There was a great deal of underproduction of poultry products due to the premature liquidation of poultry farms in some enterprises. During last and this year some began to be reinstated, but this still has not been done in 38 kolkhozes, 70 sovkhos-plants of Moldvinprom [Moldavian Wine Industry] and 40 sovkhoses of Minsel'khos [Ministry of Agriculture].

Today, with the reassignment of interkolkhoz poultry factories to the Moldptitseprom [Moldavian Poultry Association] NPO, all of the responsibilities for conditions in the branch have been placed on the association. This year the association improved its activities somewhat, but its enterprises are still dealing inadequately with the problems of creating a reproduction base for fully supplying poultry factories and poultry farms of kolkhozes and state farms with highly productive young fowl. The required order must be brought to this situation as quickly as possible.

Moving on to the status of sheep farming, the speaker noted that in four years of the five-year plan here not everything is proceeding as planned. This year the herd of sheep in the public sector comprises 95 percent of the levels of 1975, and wool production--91 percent. The main reason for the unsatisfactory situation in sheep farming is the poor material-technical base and the inadequate intensification of production. The ministry of agriculture, the kolkhoz council, Moldvinprom must radically restructure the management of the branch by improving the feed base, by concentrating the herd, by expanding the network of pedigree farms and by widely introducing progressive technology.

We frequently forget important resources for increasing meat production and especially dietetic meat production such as rabbit farming, emphasized the speaker. This year in kolkhozes and sovkhoses the herd of rabbits decreased by 21 percent. Many enterprises eliminated the branch completely. The Krolikovod [Rabbit-farming society] association is doing very little, especially in schools. At one time the komsomol was the leader in this work, but now it has let it lapse. All of this has resulted in the fact that the plan for the sale of rabbits was fulfilled by only 23 percent. Rayon executive committees must demand that the directors of kolkhozes and sovkhoses reestablish rabbit farms and organize the raising of pedigree bunnies in quantities that will satisfy the needs of the enterprises in the republic and of the population.

The personal plot of the village worker today fulfills an important socio-economic function, encourages the growth of material well-being in workers and the increase in the production of agricultural products. In a speech at the November 1978 Plenum of the CPSU Central Committee L. I. Brezhnev emphasized, "It is also necessary to create a certain public climate in which kolkhoz farmers and workers of sovkhoses would feel that by raising livestock and poultry at home they were doing something useful and advantageous for the state."

With the goal of attracting more meat into state reserves and of strengthening the material incentives of the population for raising livestock and poultry, the Council of Ministers of the Moldavian SSR in 1978 passed a resolution on the organization of the countersale of mixed fodder for procured livestock and poultry. However, these measures are poorly utilized in a number of rayons and the republic underproduces a large quantity of meat. Rayon executive committees must activate this work and in 1980 see that each rural soviet fulfills its plan for each type of production. They must aid the population in acquiring piglets, chicks and in organizing the sale and acquisition of feed. The speaker devoted a great deal of time to the problem of strengthening the feed base for public livestock farming. He noted that to fulfill this goal the republic has created 38 specialized associations. They have 183,000 hectares of plowland, including 27,000 hectares that are irrigated. The associations are composed of 41 mixed-fodder plants, 35 plants producing full-ration granules and briquettes, carbamide concentrates and other supplements. All of this has enabled farmers to increase feed resources.

Nevertheless the questions of creating a guaranteed feed base are still being dealt with slowly. The growth of feed production and its quality lag significantly behind the needs of livestock farming. Feed crops occupy over 400,000 hectares, or 23 percent of the arable land, each year. But the average productivity of crops remains low. Whereas in associations 41 quintals of feed units per hectare are produced in various feeds, on the remaining 217,000 hectares only 30 quintals are produced. This results in the underproduction of over 200,000 tons of feed units. The main reason is that within the structure of the feed fields a large proportion are sown in low-productivity annual grasses.

The seed-farming of alfalfa is organized badly in kolkhozes, sovkhoz-plants and sovkhozes. The plans for the procurement of seed are not fulfilled yearly, which hinders the expansion of areas in perennial grasses. In 1980 it is essential to secure a yield of no fewer than 60-70 quintals of feed units per hectare. Alfalfa, soy and corn for silage should prevail in the structure of feed lands.

At the present time, continued Comrade Stepanov, the most responsible period in livestock farming is now underway--the overwintering of livestock. Its quality will greatly affect the success of the continued improvement of the branch and the fulfillment of responsibilities for the current and for next year. Right now this is the shock sector at which all activities in the village are directed.

In the republic there are 1,214 feed shops of which 100 are not operable. In a number of enterprises of Floreshtskiy, Kantemirskiy and Teleneshtskiy rayons feed shops and lines have not been put into production and many mechanisms are in a state of disrepair. In the republic as a whole 245 feed mixers and 117 feed grinders and crushers have not been installed.

At the present time things should be organized so that concentrates are fed to animals only in the form of mixed fodder. The production of granules from coarse feeds with the use of concentrated feeds and other supplements should be started everywhere. It is also essential to create, without hesitation, transportation detachments and to supply them with the necessary loading-unloading mechanisms, to provide schedules for the delivery of raw materials to plants and of feeds to complexes and farms and to establish daily controls over their fulfillment.

State enterprises are fulfilling their plans for the production of mixed-fodder and protein-vitamin supplements, but they should increase their quality. The ministry of procurement must secure the uninterrupted production of specialized mixed fodder for piglets, calves of different ages and for pregnant and suckling sows.

During the overwintering period the enterprises of Goskomsel'khoztekhnika [State committee of the agricultural equipment association] are called upon to play a large role in aiding kolkhozes, sovkhozes, sovkhoz-plants and interenterprise complexes. Together with enterprises they must do everything so that each farm and complex has equipment that operates uninterruptedly.

Livestock farmers have many complaints against Moldglavenergo [Moldavian main administration of energy], whose enterprises switch off electrical energy in complexes and farms for many hours without the approval of rayon executive committees. This occurs especially frequently during the winter period, resulting in a loss of weight gain, milk and in the contraction of diseases by animals.

The winter is a time of intense work as well as of mass study for livestock farmers. Each worker of the complex and farm must be equipped with the leading methods and work skills, with the achievements of science and technology. It is essential to more broadly organize socialist competition among the workers of the branch, to persistently disseminate progressive experience and to utilize the measures of moral and material incentives everywhere. We also cannot forget about the creation of fitting conditions for work and rest for livestock farmers. Hot meals should be organized for them.

The coming year 1980 will be replete with great political events in the lives of the country and republic. This is the 110th anniversary of the birth of Vladimir Il'ich Lenin, the year of preparations for the 26th CPSU Congress, the year of elections to the Supreme Soviet of the Moldavian SSR and to local republic soviets and the final year of the 10th Five-Year Plan. It is everyone's duty to meet the important dates and events with new labor successes.

The Central Committee of the Moldavian CP and the Council of Ministers of the Moldavian SSR, said Comrade Stepanov in conclusion, have expressed their belief that the livestock farmers of the republic will make every

effort and will utilize all of their experience and knowledge to successfully conclude overwintering and to secure the fulfillment of the socialist obligations for 1980.

The first secretary of the Central Committee of the Moldavian CP, I. I. Bodayul, spoke at the meeting.

The socialist obligations for livestock farmers in the republic for 1980 were accepted.

With great enthusiasm the members of the conference met the salutatory letter of the Secretary General of the CPSU Central Committee and Chairman of the Presidium of the USSR Supreme Soviet, Comrade L. I. Brezhnev.

Participating in the work of the meeting were members of the Bureau of the Central Committee of the Moldavian CP, P. V. Voronin, N. V. Merenishchev and P. P. Petrik.

8228

CSO: 1824

REGIONAL DEVELOPMENT

MOGILEV AREA FARM PROBLEMS, PROSPECTS

Minsk ZVYAZDA in Belorussian 10 Feb 80 p 1

Article by Mogilevskaya Obkom First Secretary V. V. Prishchepchik:
"Our Stride is Confident, Inspired"

Excerpts | Last year was a difficult one for workers in agricultural production. But for farms such as Kolkhoz imeni Kirov in Shklovskiy Rayon, Rassvet and imeni K. P. Orlovskiy in Kirovskiy Rayon, Krasnyy Oktyabr' and XXI S"yezd KPSS in Mstislavskiy Rayon, Put' Lenina in Goretskiy Rayon, and many others the crop yields of the fields and the productivity of the stock farms remained stable under all conditions.

The high achievements of the leaders and their thousands of followers are due to creative questing, vigorous efforts to adopt scientific organization of labor, increased quality of output, and also substantial strengthening of the material-technical base of the kolkhozes and sovkhoses. In the first four years, the farms' fixed productive capital grew by 36 percent. The power-to-labor ratio rose, reclaimed and improved land areas were expanded, and mineral fertilizer deliveries were increased.

While noting the positive results of development in all sectors of the oblast's national economy, we cannot and must not be content with our achievements, especially since last year, as in the preceding year, even the plan targets with respect to a number of indicators were not fully met. Unfortunately, we have yet to get to the point where there are no more lagging enterprises, construction projects, kolkhozes, and sovkhoses in the oblast. Dozens of worker collectives have yet to reach targeted goals with respect to output volume and labor productivity. Industry in Krichev and Mogilev's Oktyabr'skiy Rayon are still in arrears with respect to product sales.

6854

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REGIONAL DEVELOPMENT

VITEBSK AREA FARM ACHIEVEMENTS, PLANS

Minsk ZVYAZDA in Belorussian 24 Jan 80 p 1

[Article by Vitebskaya Obkom First Secretary S. M. Shabashov:
"With a Sense of High Responsibility"]

[Excerpts] We have a number of farms which produced pretty good harvests of grain and other crops despite very bad weather conditions last year. Thus, the Mezhave and Ust'ye experimental bases, the Spartak and imeni Lenin kolkhozes in Orshanskiy Rayon, and Kolkhoz imeni Krasnaya Armiya in Vitebskiy Rayon produced grain yields averaging 26 to 31 quintals. How did this come about? It was because they used first-class seed with high germination vigor, prepared the soil properly with leveling and rolling, harrowed the winter and spring crops in early spring, and applied proper amounts of mineral and liberal amounts of organic fertilizers. The toilers of the field on these farms are confidently turning to selective handling of field operations as the soil on small sections becomes ready and are successfully utilizing the line-group potochnyy-gruppovoy technique of organization of labor. All of this, even under present weather conditions, is yielding excellent results.

At present, more than 500,000 workers in the oblast are in competition for successful completion of five-year plan targets and a worthy greeting for the 110th anniversary of V. I. Lenin's birth. Competition under the slogan "Produce More Goods of Higher Quality at Less Cost" is bringing forth new names of right-flank leaders. Already more than 3,000 workers in the Vitebsk area have already completed their own five-year plans, and many have surpassed them.

The situation as regards capital construction is a difficult one. In the first four years of the five-year plan, uncompleted construction-installation work plans totaled almost five million rubles; deadlines for putting vital projects into operation are not being met. Because of shortfalls in agricultural output, substantial quantities have not been delivered to the state.

In accordance with the decisions of the 20th Belorussian CP CC Plenum we are supposed to produce at least 1.75 million tons of grain this year with average yields of 32 to 33 quintals per hectare, to achieve potato yields of at least 180 quintals, and flax fiber yields of 5.6 quintals. We are supposed to produce 3.435 million tons of feed units, of which 20 quintals are to be allocated per standard head of livestock during the coming stabling period.

6854

CSO: 1824

REGIONAL DEVELOPMENT

FARM ACHIEVEMENTS, PROSPECTS IN GRODNENSKAYA OBLAST

Minsk ZVYAZDA in Belorussian 5 Feb 80 p 1

[Article by Grodnenskaya Oblispolkom Chairman S. Ts. Kabyak:
"A Survey of the Land Along the Neman"]

[Excerpts] The industrialized Grodno area is a land of developed agriculture. This is the result of successful implementation of the party's agrarian policies. In recent decades the oblast has carried out considerable work to strengthen the material-technical base of the kolkhozes and sovkhozes, to raise the quality of land cultivation, chemicalization, and reclamation. The main thrust now is specialization and concentration of agricultural production, converting it to an industrial basis. In recent times alone, dozens of big stock farms and complexes have been built and are functioning as genuine milk and meat factories.

As is well known, last year was exceptionally difficult and unfavorable. Even under such difficult conditions, however, our grain farmers achieved considerable success. Each hectare yielded an average of 18.6 quintals of grain, 204 quintals of potatoes, and 335 quintals of sugar beets. The livestock farmers were just as diligent. For every 100 hectares of farm land they produced 151.5 quintals of meat and 455.5 quintals of milk. Of course, we have a number of farms and whole rayons where the indicators are much higher.

But what we have accomplished is already yesterday's news. Today we face new tasks, new targets. For our oblast, the main problem continues to be that of steadily boosting grain production. This is especially important for further intensification and enhancement of all sectors of livestock farming. This is why in the concluding year of the five-year plan the goal has been set of raising grain production to at least 1.38 to 1.54 million tons. And to achieve this amount it will be necessary to get 34 to 36 quintals from each hectare. Clearly, it is a tough task, but it is a realistic one and we have all the possibilities to accomplish it. The livestock farmers have also taken on intensive obligations.

REGIONAL DEVELOPMENT

GOMEL'SKAYA OBLAST AGRICULTURAL PLANS, ACCOMPLISHMENTS

Minsk ZVYAZDA in Belorussian 17 Feb 80 p 1

[Article by A. Malafeyev, chairman of the executive committee of the Gomel'skaya Oblast Soviet of People's Deputies: "Confident Action"]

[Excerpts] The 10th Five-Year Plan has become a qualitatively new stage in the development of the oblast's agriculture, of its conversion into a highly-intensive sector. Last year, average potato yields were 187 quintals per hectare; 55 farms had over 250 quintals. Teams [zven'ya] headed by machinery operators Viktor Masyutkin of Dobrushskiy Sovkhoz and Aleksandr Khodas of Oborona Kolkhoz (Dobrushskiy Rayon), and Nikolay Zhukov and Anatoliy Dzemidzenko of Vedrych Sovkhoz (Rechitskiy Rayon), harvested averages of 345 or more quintals of potatoes. More than 30 quintals of grain per hectare were harvested on kolkhozes Pobeda, imeni Zhdanov, and Novaya Zhizn' (Zhirkovichskiy Rayon) and imeni Uritskiy (Gomel'skiy Rayon).

Despite the difficult trials that fell to the lot of the grain farmers, agricultural workers, with the active participation of industrial enterprise workers, passed the test with honors and carried out the main mission-- that of procuring about two million tons of green fodder and leaves and twigs from forests and marshes, creating the necessary base for further boosting the output of livestock products.

This year we face intensive plans. It is essential not only to meet 1980's targets but also to make up for the shortfalls of livestock and vegetable products in preceding years of the five-year plan. We will have to harvest an average of 31 to 33 quintals of grain per hectare and achieve average potato yields of at least 190 to 200 quintals per hectare.

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REGIONAL DEVELOPMENT

AGRICULTURAL ACCOMPLISHMENTS, PLANS IN MINSKAYA OBLAST

Minsk ZVYAZDA in Belorussian 20 Jan 80 p 1

[Article by Minskaya Obkom First Secretary U. A. Mikulich:
"With Confident Strides Toward the Desired Goal"]

[Excerpts] Farm workers of the Minsk area are preparing for the Lenin Jubilee in an atmosphere of great labor and political animation. Implementing the decisions of the July 1978 and November 1979 CPSU CC Plenums and other party and governmental documents concerning agricultural development, in the first four years of the five-year plan the toilers of the fields and farms achieved the following average annual increases compared to the corresponding period of the Ninth Five-Year Plan: 13.4 percent for grain, 7.8 percent for potatoes, 23.5 percent for sugar beets, 27.8 percent for meat, 23.5 percent for milk, and 1.6 times for eggs.

Last year was a difficult one. Literally the whole oblast was involved in the struggle for the harvest. As always, the working class extended a helpful hand to the kolkhoz peasantry during those difficult times. And the people overcame the weather's caprices and brought in pretty good harvests of potatoes, sugar beets, feed roots, and other crops. National-economy plans of sales of potatoes, sugar beets, fruit, milk, eggs, and wool were successfully met.

Many farms in the oblast are successfully meeting plans of production and procurement of the basic types of farm goods under all weather conditions.

Now the oblast's livestock farmers face a crucial assignment: taking care of livestock wintering, increasing the production of meat, milk, and other goods. The task is to ensure unconditional completion of plans and socialist obligations with respect to the production and sale of livestock products while simultaneously increasing herds.

While preparing a worthy greeting for the 110th anniversary of V. I. Lenin's birth, the field and farm workers of the oblast have pledged in this concluding year of the five-year plan to increase gross agricultural output by eight percent, to boost labor productivity by seven percent, and increase production profitability by five percent. They have decided to

produce 31 to 32 quintals of grain, 200 quintals of potatoes, 210 quintals of vegetables, 250 quintals of sugar beets, and 4.5 quintals of flax fiber per hectare. On the basis of increased specialization and concentration, larger livestock numbers and higher productivity, a strengthened feed base, and improved technologies and forms of organization of labor, every hundred hectares of farm land should produce 560 quintals of milk and 130 quintals of meat.

Last year's unfavorable weather conditions considerably complicated the state of affairs in agriculture and introduced additional elements of intensity in the production and procurement of the main types of farm products. This applies to grain, flax products, vegetables, and meat. In this the oblast is in arrears to the state. Calculations have shown that we are capable of liquidating this debt by sharply increasing output in 1980. All it takes is to make vigorous use of existing reserves, to take advantage of advanced experience and scientific thinking. In short, we face a big job, responsible tasks which will require maximum discipline, organization, and effort on the part of each worker.

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CSO: 1824

AGRICULTURAL SPECIALIZATION, CONCENTRATION IN TURKMENISTAN

Ashkhabad SEL'SKOYE KHOZYAYSTVO TURKMENISTANA in Russian No 11, Nov 79
pp 27-28

[Article by T. M. Ovcharova, senior scientific worker of the Economics Institute of the TSSR Academy of Sciences: "On the Resources for Raising the Effectiveness of Specialization and Concentration in Production"]

[Text] In the republic there are still many multi-branch agricultural enterprises and small farms, which decelerates the introduction of scientific-technical progress in production and its transition toward industrialization. Under such conditions it is difficult to meet the goal of increasing the volume of agricultural production and of developing the branch at the necessary level. In connection with this the party and state have attributed great significance to the continued development of the socialization process in production on the basis of agricultural cooperation and agroindustrial integration as the most important factors in raising the effectiveness of agriculture. At the July 1978 Plenum of the CPSU Central Committee it was noted that "Interenterprise cooperation and the intensification of kolkhoz and sovkhoz production are the only and most effective ways to increase the production of agricultural products."

The cooperation of agricultural enterprises in the form of agricultural agrarian and agroindustrial associations reflects the special characteristics and needs of agricultural industrialization. It represents the continuation of a process of expanding production that was spoken about by V. I. Lenin. The creation and development of interkolkhoz and state-kolkhoz organizations, enterprises and associations raises kolkhoz-cooperative property to a new, higher level of socialization and encourages its approaching universal property. Interfarm enterprises have a positive effect on the economies of member enterprises. In organizing cooperative enterprises, kolkhozes and sovkhozes free themselves partially or completely from the production of a particular product. This enables the members to free a portion of their labor and material resources and to concentrate them on the development of the remaining branches.

The process of interenterprise cooperation has been significantly developed in rural construction. At the present time, for example, the association

Turkmenmezhkolkhozstroy [Turkmen interkolkhoz construction association] includes 40 interkolkhoz construction organizations. A tendency toward a significant growth in the fulfillment of construction and installation work has been observed as a result. During 1965-1977 the volume of such work completed by rayon interkolkhoz construction associations almost tripled.

At the same time, the process of interenterprise cooperation has not been appropriately developed in agriculture in the republic. As of 1 January 1978 the republic had six interenterprise livestock-raising complexes, 10 interenterprise fattening enterprises and six interkolkhoz fattening bases. Whereas the livestock-raising complexes are narrowly-specialized (two of them raise hogs, three fatten only cattle and one fattens livestock as well as sheep), interfarm fattening enterprises and bases usually combine the fattening of several types of livestock.

The basis for the organization of these enterprises is the splitting of the technological chain of raising and fattening animals into two technological stages. In other words, narrowly-specialized enterprises are being created. Nevertheless, in interfarm enterprises and bases this process is not accompanied by a more thorough interenterprise specialization. Frequently there is here a low concentration of herds being fattened. In the fattening enterprises of Chardzhouskaya Oblast in 1978 there were 949-5,700 head of cattle, 173-1,800 hogs, 289-1,500 sheep and 9,000 birds.

The multi-branch nature of specialization in interfarm enterprises and interkolkhoz bases is one of the main reasons for the unstable effectiveness of production there. Thus, in 1977 in Cherdzhouskaya Oblast the profitability of fattening cattle in feedlots was 5.6-110.7; sheep--12.1-54.1; and hogs--5.3-41.6 percent.

A high level of productivity is secured in all fattening enterprises and bases. Thus, the average daily weight gain in livestock fluctuates here in the following: for cattle--from 293 to 728 grams; for sheep--from 90 to 415 grams; for hogs--from 200 to 727 grams. This can be compared to the average 214, 208 and 207 grams respectively in the republic's kolkhozes.

In 1978 in the association Glavzhivprom [Main Administration of the Livestock Industry] there was an underproduction in comparison with the plan of the following weight gains: of cattle--2,225 tons; hogs--865 tons; and sheep--1,627 tons.

The situation is somewhat different in the fattening complexes of the republic, where in contrast to multi-branch fattening enterprises, the breakup of the technological chain of raising and fattening is accompanied by thorough production concentration. In 1978 in the Gyaurskiy Fattening Complex the profitability of fattening cattle was 51.5 percent. At the Sayram-Aliyskiy it was 54.7 percent, as compared with 40 percent on the average in the republic's kolkhozes. In Gyaurskiy Complex the cost of 1 quintal of weight gain was 116 rubles, which is almost half of the average in the republic's kolkhozes.

In the Bayram-Aliyskiy Complex the weight gain of cattle was 783 grams, which is over 3.5 times higher than the average for the republic's kolkhozes.

The high effectiveness of specialization and concentration of agricultural production is attested to by the economic activities of the dairy complex in the Sovkhoz imeni 9 Ashkhabadskikh Komissarov, where the herd of cows exceeded 2,000 head. In the complex the milking of cows is 79 percent mechanized and operations such as the distribution of water and feed and the cleaning of facilities are over 93 percent mechanized. The significant level of mechanization of production processes enabled workers to bring direct labor expenditures per 1 quintal of milk to 4.87 man-hours (on the average in the republic's kolkhozes they are 11.9 man-hours). The profitability of milk production in the sovkhov was 1.7 percent as compared with -4.3 on the average in the republic's kolkhozes. The profitability of milk production in this sovkhov as well as in other complexes could be higher. Nevertheless, the production of 1 quintal of milk here costs more than on the average in the republic's kolkhozes. This is related firstly to the large proportion of amortization deductions within the structure of milk costs and in turn is the result of the not always satisfying of existing funds in dairy complexes, as well as of their low quality and slow pace of construction.

The plans which are now used to build livestock complexes also need to be improved. The plan for the 800-head cattle farm in the Sovkhoz imeni 9 Ashkhabadskikh Komissarov was approved in 1967. According to the plan the load per milkmaid should be 31-33 cows as compared to 20-25 cows for a milkmaid working manually. In practical terms this type of mechanization cannot bring about a high level of production effectiveness under conditions of an expensive livestock place.

The high cost of one livestock place (in the Sovkhoz 9 Ashkhabadskikh Komissarov in the first complex--2,750 rubles; in the second--2,000 rubles) is the main reason for the increased proportion of amortization deductions in the cost structure.

For the above reasons the cost of eggs and weight gain in poultry factories is higher than on the average in the republic's kolkhozes. The lowest cost of 1,000 eggs occurred in 1978 at the Tedzhenskaya Poultry Factory (154.3 rubles). Still, this level is 1.5 times higher than the average in the republic's kolkhozes.

In poultry factories production output is increasing significantly each year and their proportion in total poultry production output is growing. Whereas in 1976 the Sayatskaya Poultry Factory produced 0.1 percent of the eggs produced in the kolkhozes of Chardzhouskaya Oblast, in 1977 this figure increased to 23.5 percent and in 1978 to 27.4 percent. The advantages of poultry factories are especially noteworthy with regard to the low labor expenditures per 1,000 eggs. These expenditures were significantly lower in all four poultry factories in 1978 than on the average in the republic's kolkhozes (25 man-hours) and comprised from 4.4 to 8.4 man-hours.

The transition of livestock farming to an industrial base is an objective factor. It is unavoidable, yet despite the indisputable and evident advantages of agricultural and agroindustrial cooperation, these processes of socializing production are still poorly developed in our republic.

Among the main reasons that progress is being hindered is the low level of mechanization within the branches of agriculture, especially in livestock farming; the shortage of a number of machines and mechanisms and their low quality; the mechanization of only individual technological processes and not the production process as a whole. The level of mechanization of watering, feed distribution and cleaning of facilities, for example, was from 50 to 100 percent in the republic's fattening complexes in 1978 and from 0 to 100 percent in interfarm enterprises and bases.

One of the reasons for the low level of mechanization of production processes is the inadequate utilization of existing mechanization resources in enterprises.

In Karabekaul'skiy Hog Sovkhoz all of the necessary equipment is available for bringing this branch to complete production mechanization, and mechanization comprises 95 percent. Nevertheless, in actuality each hog man in the sovkhaz takes care of fewer than 50 head of swine, which is a low indicator under conditions of almost complete mechanization.

It should be noted that the basic plans for livestock-raising complexes include plans that were drawn up for other climactic zones in the country. In connection with this the special features of the hot, dry climate of our republic are not always taken into account. In particular, the necessary attention is not always given to air conditioning and ventilating the facilities. Air conditioning equipment is not installed on schedule and is frequently in a state of disrepair.

The relations between interfarm enterprises and member enterprises are still imperfect.

In February 1979 the republic introduced accounting prices for livestock that is delivered for fattening. The system of accounting prices provides incentives for the enterprise to deliver livestock for fattening when its nutritive state is better and to deliver calves for raising and fattening at a younger age. The accounting price of 1 quintal of calves at the age of 6-12 months is less than half the price of calves at the age of less than 20 days.

At the present time the livestock that is delivered by member enterprises does not remain in their balances. It is purchased by the interfarm enterprises, which have at their disposal large sums of working capital for acquiring livestock.

At the present time accounting prices for all sex-age groups of livestock have not been worked out for all zones of the republic. Because of this the previous procurement prices still remain in existence. All of this somewhat complicates the joint accounting of member enterprises and inter-farm enterprises. And the work to develop accounting prices should be accelerated.

Another important barrier to making specialization more thorough and to strengthening the concentration of agricultural production is the inadequate understanding of this process by some directors of enterprises who have become used to a multi-branch structure and to whom the new forms of socialized production appear complex and almost inaccessible. Here, evidently, education work pointing out the advantages of the new forms of production organization is needed.

8228

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TILLING AND CROPPING TECHNOLOGY

NEW INTENSIVE STRAIN OF SPRING WHEAT INTRODUCED

Saratov STEPNYYE PROSTORY in Russian No 10, Oct 79 pp 28,29

[Article by P. A. Reshetov, director of the Kutulukskiy Sovkhoz, and N. I. Glukhovtseva, chief of the laboratory for selection of spring wheat of the Kinel'skaya State Strain-Testing Station: "An Intensive Strain of Spring Wheat"]

[Text] The Kutulukskiy sovkhov in Kinel'skiy Rayon in Kuybyshevskaya Oblast has a large irrigation system that intended for irrigating 5,000 hectares. Until recently the main irrigated grain crop has been barley, which has significantly surpassed spring wheat in terms of its yield (see Table 1).

Table 1. Yield of Grain Crops With Irrigation on Kutulukskiy Sovkhoz in 1970-1972

Crop	Yield of grain, quintals per hectare, in the years			Average for 3 years, quintals per hectare
	1970	1972	1973	
Winter wheat	29.1	23.2	25.6	26.0
Spring wheat	19.3	21.8	18.4	19.8
Barley	21.6	24.7	24.5	23.6

Since 1970 the sovkhov has been engaged in the selection of highly productive strains of grain crops for irrigation. In keeping with an assignment from the oblast agricultural administration, in 1975 the sovkhov concluded an agreement for joint work for the selection of promising strains of spring wheat and barley with the Kinel'skaya selection station of the Kuybyshev Agricultural Institute. As a result of this work, the selection of spring wheat was established with the Lyutestsens 83 strain which was given the name Kutulukskaya. In 1976 it was submitted for state testing and in 1979, in keeping with data for two years, it was regionalized for

Irrigated and nonirrigated in Kuybyshevskaya Oblast and in 1978--in Ulyanovskaya Oblast.

This strain was obtained by complex hybridization of geographically distant forms: Saratovskaya 29 X (LixUnRRA). The specimens from American selection, LixUnRRA are distinguished by short stalks, resistance to fungal diseases and lodging and excellent quality of the grain.

Kutulukskaya took on the best properties of the initial domestic and foreign strains. A brief description of the strain: variety--Lyutetsens; spike--white, large, of medium length or long, of average density and well filled with grain. The spikelets contain much grain and can form up to 60-84 kernels in one spike. The grain is long and oval, vitreous, a dark red and very large (the weight of 1,000 kernels is 42-56 grams). The strain is resistant to shedding and grouting of the grain.

The culm is shortened (70-100 centimeters), thick, durable and resistant to lodging. The leaves are broad, long and dark green. The plants are capable, under favorable conditions, of great productive bushiness (up to 4-6 and more stalks). Under favorable conditions the secondary stalks and spikes become as well developed and strong as the main ones.

In terms of its growing period it is included among medium ripening strains, ripening 2-3 days later than Saratovskaya 36. In terms of drought- and heat-resistance it is as good as strains of Saratovskaya selection. It is distinguished by comprehensive resistance to brown rust and loose and covered smut.

The flower milling and bread baking qualities are excellent. According to data of the technological laboratory of the State Commission for Strain Testing of Agricultural Crops, the vitreosity of the grain of this strain from the 1975 crop was 96 percent, the protein content in the grain--15.9 percent and the crude gluten content--40 percent. The flour strength--418 jouels (with 280 jouels wheat is included among strong varieties); and the volume of bread from 100 grams of flour--920 milliliters. The grain from the 1976 and 1977 crops is also distinguished by high quality: the protein content is up to 16.7 percent; crude gluten--up to 49.2 percent; the flour strength--more than 500 e.a.; the volume of bread--up to 600-695 milliliters. Under irrigation conditions (1978) Kutulukskaya grain raised at the Kinel'skaya State Strain Testing Station, was characterized by the following indicators: the content of crude gluten in the flour--from 40.4 to 49.2 percent; quality group--I; flour strength--301-431 e.a.; the volume of bread--420-560 milliliters. The grain obtained on the Kutulukskiy sovkhos with irrigation in 1978 had the following indicators: content of crude gluten--31.5 percent, quality group--I; flour strength--419 e.a.; volume of bread--550 milliliters.

The productivity of the strain on irrigated strain testing sections of Saratovskaya oblast amounted to: Engel'skiy--43.1 quintals per hectare in

1976, 42.2 quintals per hectare in 1977, and 48.6 quintals per hectare in 1978, which is 5.4-11.2 quintals per hectare more than the standard; Pugachevskiy--47.0 (+ 9.4 quintals per hectare), 42.2 (+ 15.3 quintals per hectare) and 52.2 (+7.8 quintals per hectare), respectively. For Kuybyshevskaya Oblast: the Kuybyshevskiy State Strain Testing Station--38.7 quintals per hectare (+ 4.8), 30.1 quintals per hectare (+ 0.2) and 36.8 quintals per hectare (+ 9.0 quintals per hectare); Bezenchukskiy--in 1976, 32.5 quintals per hectare (+ 0.1), in 1977, 38.7 quintals per hectare (+ 6.5 quintals per hectare) and in 1978, 49.7 quintals per hectare (+ 9.7 quintals per hectare).

On the production areas of the Kutulukskiy sovkhos the yields of the new strain of grain were the following: in 1976--45.0 quintals per hectare, in 1977--41.5 quintals per hectare and in 1978--38.0 quintals per hectare (area--300 hectares). In 1978 the sovkhos produced about 8,000 quintals of seeds of the Kutulukskaya strain, of which they kept 1,000 quintals for planting and the remainder, by an order of the oblast agricultural administration, they sold to farms of Kuybyshevskaya and other oblasts.

It is interesting to compare the yields of the new strain of spring wheat with the yields of barley and winter wheat (see Table 2).

Table 2. Yield of Grain Crops on Kutulukskiy Sovkhos with Irrigation in 1976-1978

Crop	Strain	Grain yield, quintals per hectare			Average for years of study, quintals per hectare
		1976	1977	1978	
Winter wheat	Mironovskaya 808	--	--	43.8	43.8
	Krasnodarskaya 39	--	--	38.7	38.7
Spring wheat	Kutulukskaya	45.0	41.5	38.0	41.5
	Khar'kovskaya 46	33.4	--	--	33.4
Barley	Nutans 187	26.1	20.0	--	23.1
	El'gina	32.2	20.0	26.4	26.2
Oats	Al'za	34.6	29.3	25.3	29.7
	Astor	43.6	32.4	37.8	37.9

The figures in Table 2 show that on an average for three years the Kutulukskaya spring wheat essentially (by 3.6-15.3 quintals per hectare) surpassed strains of barley and oats in terms of its yield.

With the observance of the correct agrotechnology for the cultivation of the strain, Kutulukskaya is capable of producing a yield of 50 and more quintals per hectare. On experimental plantings on the Kutulukskiy sovkhos with the application of $N_{20}P_{20}K_{20}$, its yield reached 57.4 quintals per hectare.

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MINERAL FERTILIZERS APPLIED TO GRAIN CROPS

Saratov STEPNYYE PROSTORY in Russian No 8, Aug 80 pp 14-16

[Article by V. G. Podgornov, candidate of agricultural sciences, Republic Control Agrochemical Laboratory of the RSFSR Ministry of Agriculture: "Fertilizing the Grain Field"]

[Text] The deliveries of fertilizers to the kolkhozes and sovkhoses of Povolzhskiy Rayon are extremely limited so far. There is an average of about 1.5 quintals of fertilizers in standard calculation per hectare of plowed land. A considerable portion of the quantity of fertilizers that is delivered is used primarily for irrigated areas planted in sugar beets, potatoes, vegetables and other valuable agricultural crops. Therefore each kilogram of fertilizers left for grain crops must be utilized efficiently in order to gain a maximum return with additional yields of grain.

The tested and economically advantageous methods of applying fertilizers to grain crops in the oblasts and autonomous republics of the Povol'zhe are local methods of their application in the area to which the root system spreads. Local application of fertilizers in small amounts makes it possible under arid conditions to obtain an additional yield of grain on phosphorus-poor soil in the same amount that is obtained with broadcast application of large doses of fertilizers. The placement of fertilizers near the root system creates a zone of increased concentration of nutritive substances and this facilitates their absorption and increases the efficiency factor of the plants' utilization of nutritive elements through their more complete assimilation and it also reduces their fixation by the soil and microorganisms.

The application of fertilizers (especially phosphorus fertilizers) along with the seeds accelerates the beginning of the growth and the continuation of the development of the plants, which, in the final analysis, contributes to the struggle of the crop plants against weeds, pests and diseases and accelerates the ripening of the crop. Moreover, under arid conditions placing the fertilizers in the moist layer of soil produces a significant advantage over the broadcast (surface) application of fertilizers.

These requirements are met most completely by row placement of phosphorus-containing fertilizers along with the planting of grain crops, basic local (band) placement of fertilizers in cultivated soil and root dressing of winter grain crops.

Row placement of phosphorus fertilizers along with the planting of grain crops along with SUK-24A, SZA-3.6 and SZS-2.1 combined seeders in a dose of P_{10-15} produces a significant additional yield in all soil and climatic zones of Povol'zhe.

On the dark chestnut soils of Volgogradskaya Oblast on an average for eight years the additional yield of grain from spring wheat with row placement of superphosphate in a dose of P_{10} amounted to 2 quintals per hectare, including an average of 1.1 quintals during the four dry years and 2.8 quintals per hectare during the five more favorable years.

According to data from production experiments with mineral fertilizers conducted by the agrochemical services of the Bashkirskaya and Tatarskaya ASSR's and of Kuybyshevskaya, Penzenskaya and Saratovskaya oblasts, there were high additional yields with the application of superphosphate in a dose of P_{10-15} . In various years they amounted to: for winter rye--2.2-4.1 quintals per hectare, winter wheat--1.7-3.1, barley--2.2-3.3, spring wheat--0.7-3.7, and buckwheat and millet--1.6-3.7 quintals per hectare. Every ruble of expenditures invested in fertilizers and work related to their application, with the introduction of this method, is repaid with 1.5-4 rubles, that is, the level of profitability reaches 150-400 percent. The application of the same dose of fertilizers on the surface, with pre-planting cultivation, reduces their effectiveness 1.5-2-fold as compared to row placement. An increase in the dose of phosphorus fertilizers when they are applied in the rows to 30-40 kilograms and also the application of Nitrophoska and Ammophos with the same quantity of phosphorus does not, as a rule, create any advantage over superphosphate. The kolkhozes and sovkhozes of Povolzhskiy Rayon, taking advantage of the high effectiveness of row placement of fertilizers, in 1978 increased the area planted in grain crops along with the application of fertilizers almost 3-fold as compared to 1974 (see Table 1).

But it should be noted that the resources of phosphorus containing fertilizers for their application in the rows should be utilized only by half in Povol'zhe while their availability makes it possible to plant winter and spring wheat crops with the simultaneous application of fertilizers on 55-60 percent of the area. This progressive method is being introduced especially poorly in the Kalmykskaya ASSR and Saratovskaya and Volgogradskaya oblasts.

In recent years in the Bashkirskaya ASSR they have begun to use more extensively the local-band application of the basic fertilizer before planting grain crops on cultivated soil. Granulated complex fertilizers or a mixture of simple granulated fertilizers are applied with grain seeders and cultivator-plant feeders to a depth of 8-10 centimeters.

Table 1. Row Placement of Mineral Fertilizers for Harvest of Spring and Winter Grain Crops During 5 Years (1974-1978)

(1) Области и автономные республики	(2) Посеяно с рядковым внесением удобрений (тыс. га/% от площади посева)				
	1974 г.	1975 г.	1976 г.	1977 г.	1978 г.
(3) Астраханская	0,1/-	-/-	-/-	-/-	1,1/0,5
(4) Волгоградская	51,3/1	90,1/2	297,8/6	465,5/11	550,4/13
(5) Куйбышевская	34,4/2	141,5/7	191,8/9	282,0/12	372,7/17
(6) Пензенская	368,5/23	435,0/23	537,8/31	466,1/25	651,7/38
(7) Саратовская	110,9/3	110,9/2	217,8/5	181,8/4	230,3/6
(8) Ульяновская	250,6/22	330,7/26	564,9/47	615,2/43	801,6/64
(9) Башкирская АССР	606,9/20	1074,1/34	1572,7/49	1674,2/49	1984,7/63
(10) Калмыцкая АССР	5,1/1	5,9/1	16,4/3	30,3/7	28,7/4
(11) Татарская АССР	715,4/30	846,9/32	1052,8/42	1289,1/44	1387,9/54
(12) Итого по Поволжскому району . . .	2152,2/11	3035,1/15	4452,0/21	5005,2/23	6009,1/30
Всего по РСФСР	16 271,7/21	19 288,7/25	26 670,0/33	32 020,7/38	35 036,8/44

Key:

1. Oblasts and autonomous republics
2. Planted with row application of fertilizers (thousands of hectares/percentage of planted area)
3. Astrakhanskaya
4. Volgogradskaya
5. Kuybyshevskaya
6. Penzenskaya
7. Saratovskaya
8. Ul'yanovskaya
9. Bashkirskaya ASSR
10. Kalmytskaya ASSR
11. Tatarskaya ASSR
12. Total for Povolzhskiy Rayond
13. Total for RSFSR

Research of the Institute of Biology of the Bashkirskaya branch of the USSR Academy of Sciences, the republic station for chemization of agriculture and the agricultural institute, conducted in 1972-1978, showed the significant advantage of local-band application of fertilizers over their broadcast application during the plowing of fallow or preplanting cultivation.

The results of numerous small-plot field and production experiments with fertilizers made it possible to establish that with band application of fertilizers the size of the grain crop and the additional yield depend on weather conditions of the year, the crop, the strain, and the level of provision of nutritional elements in the soil. But with all other conditions being equal, local placement of fertilizers with a dose of nitrogen, phos-

phorus and potassium of 40-60 kilograms weighted dose made it possible to obtain a grain yield of 2-7 quintals more than with broadcast application on the surface of the soil. Thus in Chekmagushevskiy Rayon band application of fertilizers to winter rye in doses of $N_{60}P_{60}$ and $N_{30}P_{30}$ increased the yield by 5.1 and 4.7 quintals per hectare, and the application of doses of $N_{60}P_{60}$ by the broadcast method during cultivation produced an additional yield of grain of 2.3 quintals per hectare while the yield in the control group (without fertilizers) was 29.4 quintals per hectare.

In experiments with Saratovskaya 36, Khar'kovskaya 46 and Krasnoufimskaya 68 spring wheats, barley and oats on gray forest soils and leached chernozems it was established that the application of optimal and half doses of fertilizers in arid years produced practically the same additional yields.

The results of a field experiment conducted by the Bashkirskaya chemization station on the Pobeda kolkhoz in Yanaul'skiy Rayon in the critically arid year of 1975 can serve as an example of this (see Table 2).

Table 2. Effects of Doses of Fertilizers and Method of Application on Harvest of Spring Wheat

Таблица 2
Влияние доз удобрений и способа внесения на урожай яровой пшеницы

(1) Варианты опыта	(2) Урожай, ц/га	(3) Прирост урожая к контролю, ц/га	Оплата 1 кг действ. вещества NPK дополнительным урожаем зерна, кг (4)
(5) Контроль (без удобрений)	8,9	—	—
(6) $N_{60}P_{60}K_{40}$ (разброс под культивацию)	10,2	1,3	0,8
(7) $N_{60}P_{60}K_{40}$ (локально)	11,4	2,5	1,5
(8) $N_{30}P_{30}K_{20}$ (локально)	11,7	2,8	3,5
(9) $N_{60}P_{30}K_{40}$ (локально)	13,2	4,3	3,5

Key:

1. Variants of experiment
2. Yield, quintals per hectare
3. Yield in excess of control yield, quintals per hectare
4. Repayment for 1 kg of active substance of NPK by additional grain yield, kg
5. Control (without fertilizers)
6. $N_{60}P_{60}K_{40}$ (broadcast with cultivation)
7. $N_{60}P_{60}K_{40}$ (locally)
8. $N_{30}P_{30}K_{20}$ (locally)
9. $N_{60}P_{30}K_{40}$ (locally)

The return from each kilogram of active substance of fertilizers with local methods of application to spring wheat was higher on an average for 1975-1977 (see Table 3).

Table 3. Effects of Local-Band Application of Fertilizers on Yield of Spring Wheat

Таблица 3
Влияние локально-ленточного внесения удобрений
на урожай яровой пшеницы

Варианты опыта (1)	Урожай, ц/га (2)	Прибавка урожая, (3) ц/га	
		в сравне- нии с кон- тролем (4)	на 1 ц действия шести удобрений (5)
(6) Контроль (без удобрений)	15,4	—	—
(7) $N_{40}P_{60}K_{40}$ (разброс)	20,3	4,9	3,5
(8) $N_{40}P_{60}K_{40}$ (локально)	23,4	8,0	5,7
(9) $N_{20}P_{30}K_{40}$ (локально)	19,7	4,7	6,1

Key:

1. Variants of experiment
2. Yield, quintals per hectare
3. Additional yield, quintals per hectare
4. Compared to control
5. Per 1 quintal of active substance of fertilizers
6. Control (without fertilizers)
7. $N_{40}P_{60}K_{40}$ (broadcast)
8. $N_{40}P_{60}K_{40}$ (locally)
9. $N_{20}P_{30}K_{40}$ (locally)

In experiments with buckwheat conducted in 1978 by the Bashkirskaya Agricultural Institute in Sharanskiy Rayon, the additional yield of grain amounted to 6.6 quintals per hectare with local application of fertilizers, and broadcast application of the same dose during preplanting cultivation made it possible to obtain an additional yield of only 3.4 quintals per hectare while the yield in the control group (without fertilizers) was 6.2 quintals per hectare.

The placement of fertilizers locally makes it possible to increase the coefficient of utilization of nutritional. Thus in experiments with Khar'kovskaya 46 wheat during 1973 and 1974, with the application of a dose of $N_{60}P_{60}$ by the broadcast method, only 39 percent of the nitrogen and 10.5 percent of the phosphorus in the fertilizer were utilized and with the application of the second dose locally, 65.2 and 17.5 percent, respectively, were consumed.

The root method of applying nitrogen fertilizer dressings to winter crops has become more and more widespread on the fields of the kolkhozes and sovkhozes in recent years. In the Russian Federation grain seeders were used going across the rows to top dress 3.2 million hectares with nitrogen fertilizers in 1978 and in Povolzhskiy Rayon the root method was used to fertilize 894,600 hectares of area planted in winter crops, which amounted to 23 percent of the entire area that was given top dressing (see Table 4).

Table 4. Top Dressing of Winter Crops of the 1978 Harvest

Таблица 4
Подкормка озимых урожая 1978 г.

Области и автономные республики (1)	(2) Подкормлено озимых, тыс. га		
	всего (3)	в т. ч. корневой способом (4)	% корневой подкормки от общего объема (5)
(6) Астраханская	11	—	—
(7) Волгоградская	1026	77,3	7,5
(8) Куйбышевская	212	94,5	44,6
(9) Пензенская	532	96,0	18,0
(10) Саратовская	462	33,4	7,2
(11) Ульяновская	394	151,0	38,3
(12) Башкирская АССР	406	195,1	48,1
(13) Калмыцкая АССР	128	10,0	7,8
(14) Татарская АССР	593	237,3	40,0
(15) Итого по Поволжскому району	3764	894,6	23,7

Key:

1. Oblasts and autonomous republics
2. Top dressed winter crops, thousands of hectares
3. Total
4. Including by the root method
5. Percentage of root dressing in overall volume
6. Astrakhanskaya
7. Volgogradskaya
8. Kuybyshevskaya
9. Penzenskaya
10. Saratovskaya
11. Ul'yanovskaya
12. Bashkirskaya ASSR
13. Kalmytskaya ASSR
14. Tatarskaya ASSR
15. Total for Povolzhskiy Rayon

In experiments of the agrochemical service of the Tatarskaya ASSR on leached chernozem and gray forest soils, the additional yield of grain of winter rye from the application of N_{60} by the root method amounted to 3.2-3.6 quintals per hectare, which is 1-1.3 quintals more than with the broadcast method of application of fertilizers in the same dose.

According to data from four experiments with winter wheat on ordinary chernozem soil in Saratovskaya Oblast, root application of a dose of N_{60} on a background of $P_{60}K_{60}$ made it possible to obtain an additional grain yield of from 3-5.7 quintals per hectare, or 1.2-2.2 quintals more than with the broadcast method of application.

On the Sebryakovskiy and Rekonstruktsiya sovkhoses in Volgogradskaya Oblast, root dressing of Mironovskaya Yubileynaya winter wheat with a dose of N_{50} made it possible in 1977 to obtain an additional yield of grain of 3.1-3.8 quintals per hectare, or 1.9-2.0 quintals more than with broadcast application on the surface, while the yield in the control group (without fertilizers) was 39.1-40.4 quintals per hectare.

The root dressing method for winter rye and spring wheat in all oblasts and autonomous republics of Povolzhskiy Rayon demonstrated its advantage over early broadcast application of fertilizers with aircraft or ground fertilizer distributors. A comparison of the effects of ammonium nitrate and carbamide applied by the root and broadcast methods showed that these two forms of nitrogen fertilizers have almost the same effectiveness.

While rating highly the advantages of root dressing of winter grain crops over broadcast dressing, one should note that in Astrakhanskaya, Volgogradskaya and Saratovskaya oblasts less than 10 percent of the areas were top dressed in this way in 1978 and it is precisely in dry oblasts that this progressive device should be introduced most extensively.

According to calculations of the Bashkirskaya chemization station, the introduction of local methods of fertilization of grain crops in the republic during 1975-1977 on an area of 4.7 million hectares made it possible to obtain an additional 1,318,000 tons of grain and the conventional net income from the application of fertilizers amounted to 106.1 million rubles, including 58.9 million rubles from local methods of application of fertilizers.

When speaking of local method of fertilizing one can not forget about using cultivator-plant feeders for dressing corn, vegetables, potatoes and wide-row plantings of grasses and buckwheats with solid mineral fertilizers, liquid complex fertilizers and anhydrous ammonia.

The application of all of the aforementioned fertilizers by local method will make it possible to increase the agronomical and economic effect from fertilizers and to reduce the level of pollution of lakes, ponds, and large and small rivers of the Volga basin with chemical products.

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MODERN EQUIPMENT USED ON BASHKIR SUNFLOWER CROP

Saratov STEPNYE PROSTORY in Russian No 8, Aug 79 pp 18-19

[Article by R. A. Sadykov, senior scientific worker of the Bashkir Branch of the USSR Academy of Sciences, candidate of agricultural sciences, and S. N. Zaynagabdinov, chairman of the Kolkhoz imeni Lenin in Meleuzovskiy Rayon, Bashkir ASSR, Hero of Socialist Labor: "Modern Agrotechnology to the Sunflower Fields"]

[Text] Oil-bearing sunflowers are a highly profitable crop in the Bashkir ASSR. The average annual area planted in them during three years of the Tenth Five-Year Plan (1976-78) amounted to 60,600 hectares, the gross yield of seeds was 685,100 quintals, and the productivity was 1.3 quintals per hectare. As compared to the Ninth Five-Year Plan the area planted in this crop has increased by 18 percent, the gross yield of seeds--by 69 percent, and the productivity per 1 hectare--by 43 percent.

But the volume of production of oil-bearing seeds that has been achieved on the kolkhozes and sovkhoses of Bashkiriya, the level of productivity and also the quality of the seeds that are procured do not satisfy the demands of the national economy. The average sale price for one quintal of seeds decreased from 23.13 rubles in 1971-1975 to 21.99 rubles in 1976-1977 (see table).

The reduction in the sales prices was brought about by a deterioration of the quality of the seed because of the late dates of the beginning of harvesting the crop, the prolongation of the harvest and the violations of post-harvest cultivation.

The kolhozes and sovkhoses of the Bashkir ASSR have changed over to cultivating thin-husked, highly oily strains of sunflowers. Their seeds are distinguished by a certain increase in the time period for ripening and poor protective properties, which make a special difference during years with reduced temperatures and increased humidity. Under these conditions the ripening of the seeds is frequently hampered by self-warming. Moreover a hydrolysis of fats takes place in them, forming free acids, which leads to a deterioration of their quality. Unfortunately, not all farms

attach significance to this biological peculiarity of sunflowers. An analysis for 3 years of the Tenth Five-Year Plan (1976-1978) shows that on a number of kolkhozes and sovkhoses progressive forms of utilization of technical equipment and means of transportation are not being adequately introduced into the harvesting of this crop and there are violations of the optimal time periods for the beginning and the duration of harvesting work, which leads to losses of the crop because of shedding of the seeds and their infection with mold.

Table. Economic Effectiveness of Production of Oil-Bearing Sunflower Seeds in Bashkir ASSR

Indicators	1971-1975	1976-1977	1976-1977 in % of 1971-1975
Area, thousands of hectares	51.2	59.5	103
Gross yield, thousands of quintals	404.5	687.7	170
Productivity, quintals per hectare	7.9	11.6	147
Sold to state, thousands of quintals	334.3	614.1	184
Earned, thousands of rubles	7,733.2	13,501.5	175
Production cost of seeds that were wold, thousands of rubles	2,741.0	4,835.5	176
Net income, thousands of rubles	4,992.2	8,666.0	174
Profitability, %	182.1	179.2	
Production cost of 1 quintal of seeds, rubles	7.74	7.99	103
Sales price of 1 quintal of seeds, rubles	23.13	21.99	95
Labor expenditures per 1 quintal of seeds, man-hours	3.53	2.05	58

It has still not become a practice on the farms of the republic to extensively use harvest-transport complexes for harvesting oil-bearing sunflower seeds. And yet organizing the work according to the method of the Ipatovo machine operators would make it possible to utilize harvesting equipment more efficiently, to increase labor productivity and, on the basis of this, to shorten the duration of harvesting and to reduce losses of oil-bearing seeds.

In the Bashkir ASSR kolkhozes and sovkhoses of the Ural area steppe and southern forest steppe subzones engage in the cultivation of oil-bearing sunflowers and they accomodate, respectively, 80 and 20 percent of the areas planted in this crop. In the Ural area steppe the highest yields

are obtained by the kolkhozes and sovkhoses of Meleuzovskiy Rayon. On an average for 1976-1980 it ended up with 2.5 quintals per hectare more than in the republic as a whole. A large amount of experience in cultivating oil-bearing has been accumulated by farmers of the Kolkhoz imeni Lenin of this rayon. Beginning in 1956 the kolkhoz has annually fulfilled the plan for the production and sales of all kinds of agricultural products. In 1978 it harvested 26.2 quintals of grain per hectare, 305 quintals of sugar beet roots, 204 quintals of green mass from corn and 17.2 quintals of sunflower seeds per hectare.

The kolkhoz's plowed areas are located on slopes with various amounts of exposure and steepness, they are subject to average and severe degrees of erosion, and they require the application of labor-intensive anti-erosion cultivation of the soil (plowing across the slopes, making embankments, and in sharp depressions, the cutting of slots in the soil). Leached chernozem soil is predominant on the masses of land. The climatic conditions here are characterized by inadequate moisture.

Serious attention is devoted to increasing the production of commercial seeds and increasing the productivity of sunflowers on the farm. All brigades have introduced and assimilated scientifically substantiated crop rotations. Sunflowers are planted on the final field of the crop rotation after spring grain crops--spring wheat or oats--and are not planted on this field again until 8 or 9 years have passed. The kolkhoz cultivates a regionalized strain of sunflowers, Yenisey. It occupies 300 hectares of arable land annually.

On fields where sunflowers are to be planted, after harvesting the preceding crop, the stubble is plowed under with disk harrows to a depth of 6-8 centimeters and after 10-15 days, the fallow is plowed to a depth of 27-30 centimeters. If weeds appear again during a warm lengthy autumn, the fallow is cultivated to a depth of 10-12 centimeters.

In order to accumulate moisture in the winter, immediately after the first precipitation, snow retention work is done. This agricultural measure is repeated two or three times during the winter. In the spring, as the soil ripens, mulching is done to retain the moisture and after this there is pre-planting cultivation to the depth at which the seeds are planted. The soil is rolled before and after planting. The sunflower seeds are treated with a TMTD preparation in an amount of 5-6 kilograms per 1 ton of seeds five or six days before planting.

This farm begins to plant oil-bearing sunflower seeds, as a rule, at the beginning of the third ten-day period of April. These planting times contribute to earlier ripening of the crop which makes it possible to begin harvesting earlier. The planting is done by the point method with a planting norm of 15 kilograms of germinative seeds per 1 hectare, with 70 centimeters between the rows with a simultaneous application of 10 kilograms per hectare of granulated superphosphate. The seeds are planted to a depth of 7-8 centimeters.

Before germination and during germination the areas are cultivated with medium harrows. As the rows begin to appear, the first interrow cultivation is done to a depth of 6-7 centimeters and the second is done 10-12 days later to a depth of 8-10 centimeters with the simultaneous application of 1 quintal per hectare of granulated superphosphate and before the rows fill in so that their outlines disappear, a third cultivation is done to a depth of 6-8 centimeters, leaving a protective zone of 12 centimeters on each side of the row.

A mandatory device for accelerating the ripening of sunflowers and retarding the spread sclerotinosis, gray rot and other diseases is the dessication of the planted areas. Drying the plants on the root through dessication makes it possible to begin harvesting 8-10 days earlier than usual, which is especially important for farms of the Bashkir ASSR. According to data from scientific research institutions, preharvesting dessication of areas reduces the moisture content of the seeds by 10-15 percent while the productivity of the combines in harvesting the crop increases by 30-35 percent and losses of the crop decrease by 1.0-1.5 quintals per hectare.

According to data of the Scientific Research Institute of Oil-Bearing Crops the best time for beginning the harvesting of sunflowers is when 85-90 percent of the plants have brown and dry heads and the remainder have yellow heads. In ordinary years the Kolkhoz imeni Lenin begins to harvest them in the second half of September when 80 percent of the heads have turned brown. Before this they carefully develop the working plan for the harvest and envision the completion of threshing in 5-6 working days with mandatory cleaning of the seeds on the day when they arrive on the threshing floor from the combines with subsequent shipment to the state. In the working plan the load per one combine does not exceed 50-60 hectares.

Immediately after the completion of the harvest of grain crops, the farm reequips the combine for harvesting sunflowers. They operate with 34-103 adapters. They strictly follow a directly linear movement along the rows. To depart from this direct linearity leads to increased losses of the crop. In order to avoid crushing the seeds, the speed of rotation of the drum is reduced to 500 revolutions per minute.

The kolkhoz annually completes the harvesting of this crop in 5-6 working days. The wages of the combine operators and the truck drivers employed in harvesting oil-bearing sunflower seeds and material and moral incentives are the same as for those employed in the harvest of grain crops.

On an average during 1976-1980 the kolkhoz obtained 16.5 quintals of sunflower seeds per hectare, 4 quintals per hectare more than they did in the rayon as a whole. During three years the farm has almost fulfilled the five-year assignment for the sale of seeds of this crop to the state. During 1976-1978 it received an average of 118,300 rubles in earnings from the sale of sunflower seeds and 88,900 rubles in net profit. The profitability of their production amounted to 302 percent.

In 1978 when the productivity for the kolkhoz was 17.2 quintals per hectare, the team of Sharityan, Ilyashev obtained 21.6 quintals of oil-bearing seeds per hectare on an area of 96 hectares. The kolkhoz sold the state 4,212 quintals of sunflower seeds instead of the 2,700 quintals required by the plan and fulfilled the assignment by 156 percent.

The practice of the Kolkhoz imeni Lenin in Meleuzovskiy Rayon and of other leading farms of the Bashkir ASSR show that it is possible to obtain high yields of oil-bearing sunflowers with high commercial and planting qualities only with prompt and high-quality performance of all of the agro-technical complex that is stipulated by the technology for cultivating this crop.

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TILLING AND CROPPING TECHNOLOGY

MEASURES FOR COMBATING SOIL SALINITY REVIEWED

Ashkhabad SEL'SKOYE KHOZYAYSTVO TURKMENISTANA in Russian No 12, Dec 79
pp 28-29

[Article by R. Yagmurov, chief of the Cotton Administration of the Ministry of Agriculture for the Turkmen SSR and candidates of agricultural sciences O. Redzhepov, Kh. Barayev and K. Redzhepbayev: "Campaign Against Soil Salinity -- the Basis for High Yields"]

[Text] At the present time, there are more than 930,000 hectares of irrigated land throughout the republic, with more than 60 percent classified as highly saline and requiring radical soil improvement work.

The problem of land reclamation is being solve for the most part through the construction of new and the modernization of existing collector-drainage systems, major land leveling operations, the timely and high quality carrying out of leaching and through the selection of agricultural crops that are more suitable for each specific tract, taking into account the soil salinity remaining following leachings and so forth.

At the beginning of this current year, the overall length of the republic's collector-drainage network was 17,900 kilometers and the specific length for an irrigated area -- 18.7 linear meters per hectare. However, the principal cotton growing oases in the republic have not been uniformly equipped with drainage networks and collectors for drawing off ground waters.

In a number of rayons, particularly Tedzhenskiy, Murgabskiy and rayons of the Prikopetdagaskiy Oasis, the construction of a collector-drainage network is lagging considerably behind the current requirement, the rates for the taming of new lands and the development of irrigation.

There is no need for proving that a direct correlative relationship exists between the reclamative status of irrigated lands and the cropping power of the agricultural crops in cultivation.

In Ashkhabadskaya Oblast, where the specific length of the drainage network is the shortest (approximately 11 linear meters per hectare) and the index for the drawing off of drainage waters extremely low (6.6 percent of the available water), the lowest cotton yields are being obtained -- on the order of 14-15 quintals per hectare. The Tedzhen Oasis is the foundation of the oblast's cotton growing base. Prior to the arrival of Amu-Dar'ya water, the ground waters here were at a depth of more than 5 meters and in some areas -- 10-15 meters.

The arrival of the Amu-Dar'ya water brought about a sharp increase in the level of strongly mineralized ground waters. During the past 10-15 years, their level has increased to 1.5-2 meters. On some farms, as a result of failure to observe the leaching technology and an increase in the coefficient of land utilization without drainage, a general increase has been noted during the winter-spring period in the ground water level -- to 0.5-1.0 meters below the surface. Naturally, the raising of the water table to a point higher than the critical level tends to intensify the movement of salts that are toxic to plants into the soil aeration zone, thus bringing about secondary salinization of the land. The further development of irrigation farming and the intensification of agricultural production at the Tedzhen Oasis are unthinkable in the absence of radical improvements in land reclamation operations. The delta of the Tedzhen River is classified as a weakly drained territory having an extremely troublesome runoff of underground waters. Thus the speed for raising the ground waters is dependent upon the KZI [koeffitsiyent zemel'nogo ispol'zovaniya; coefficient of land utilization] and the KPD [efficiency factor] for the irrigation systems.

According to scientific-research data, satisfactory control over a salt regime, under non-drainage conditions, is achieved when the KZI for an irrigated area is 0.15-0.20. The remaining territory performs in the role of dry drainage. The disruption of this condition, in the absence of artificial drainage, can lead to the development of salinization and water-logging processes. With the construction of the Kara-Kum Canal, the KZI for the Tedzhen Oasis increased from 0.2 to 0.5 and the water intake was increased threefold, thus exceeding 1 billion cubic meters for Tedzhenskiy and Kirovskiy rayons. Thus the salt accumulation and land salinization processes are progressing at the Tedzhen Oasis. In 1959 the area of medium and strongly saline land at the oasis amounted to 12 percent of the overall area, in 1968 -- 33 percent and in 1978 -- 54 percent. In 1959 the area of solonchak soil equalled .58 percent of the irrigated land area, in 1968 -- 3.8 percent and in 1978 -- 11.4 percent. Moreover, the area of solonchak soil progressed from a spotty distribution to a strong development. The construction rates for the collector-drainage network at the oasis do not correspond to the growth in the area under crops or the water intake volumes. The specific length of the collector-drainage network for Tedzhenskiy Rayon is 12 linear meters per irrigated hectare and for Kirovskiy Rayon -- 9 linear meters. According to the design data, the

specific length of a collector-drainage network in these rayons, one which will not cause the ground waters to rise, must be on the order of 45-50 linear meters per hectare. The weak runoff of drainage waters is one of the principal causes of the ground water level rising and also of increased soil salinity. As the area of saline lands increased, the norms for leaching waterings became higher. However, the leaching capability of the waterings, owing to nearby ground water seams, decreased considerably.

The efficiency of the drains and the reclamative status of land are noticeably influenced by the lithologic structure of the soil.

The mechanical composition of the soil found over a considerable portion of the irrigated land at the Tedzhen, Murgab and Prikopetdagskiy oases (plain portion) and particularly the Khauz-Khan land tract is heavy textured and compacted and this represents one of the reasons for the low water yield of the soils through the drains and drainage runoff per unit of area.

According to computations carried out by VASKhNIL [All-Union Academy of agricultural Sciences imeni V.I. Lenin] Academician I.S. Rabochev, based upon the results of special studies, the optimum drainage module, one which will ensure the creation of the best water-salt and nutritional regime for soils, is 0.25 liters per second.

The most unfavorable situation with regard to the withdrawal of mineralized ground waters in the republic exists at the Murgab and Tedzhen oases, that is, in the growing regions for fine-fibred varieties of cotton. Here the drainage module was 0.086 and 0.051 liters per second per hectare, or 4-5 times less than the required norm. A stagnation of ground water actually occurs and the average annual runoff of mineralized waters at the Tedzhen Oasis is on the order of 110 cubic meters per hectare.

At the present time, hydromorphic processes of soil formation and secondary soil salinization are taking place at the Tedzhen Oasis, at the Khauz-Khan land tract and also in the plain portion of the zone of the 3d and 4th phases of the Kara-Kum Canal. For the desalinization of land, in accordance with experimental data, the degree of salinity in terms of the chlorine content in a layer 1 meter thick must be 0.02 percent of the weight of the soil, or 3 tons per hectare. However, under the existing reclamation situation, the leaching of land to such a condition is very difficult and a considerable increase is required in the leaching norms. Thus a number of tracts of land are not being leached adequately and this leads to plant losses, to a thinning out of the plantings of cotton and other agricultural crops and to a considerable reduction in cropping power.

The ground waters of the Tedzhen Oasis are mineralized to 30-40 grams per liter, including chlorine -- 10-12 grams per liter. This derives from the dissolving of salts in the deep layers and their movement upwards with the ground waters.

The salt content in the soils of the Tedzhen Oasis can be described using the following data: strongly saline soils in a layer 1-meter thick contain a dense residue which is 0.4-0.9 percent by weight (61-148 tons per hectare) including chlorine -- 0.13-0.18 percent (20-30 tons). The leaching out of salts requires a leaching norm of 6,000-8,000 cubic meters per hectare. Soils of medium salinity contain 0.40-0.55 percent salts, including chlorine -- 0.06-0.10 percent (60-80 tons and 9-15 tons respectively), the removal of which requires a leaching norm of 4,000-6,000 cubic meters per hectare. Weakly saline soils contain 0.15-0.30 percent salts, including 0.02-0.03 percent chlorine (15-30 and 3-7 tons), with the leaching norm being 2,500-4,000 cubic meters per hectare. On solonchak soils, the accumulation of salts is very high -- 0.8-2.9 percent (130-425 tons per hectare) and the leaching norms required for freshening them must be increased to 15,000-20,000 cubic meters per hectare. The salts of the oasis are mainly sulphate-chloride in nature and their solubility is rather high, but the nearby stratification of ground waters precludes the possibility of their movement into the lower soil layers.

A radical measure for combating the upward movement of ground waters and soil salinity is the specific length of the collector-drainage network -- increased to the optimum dimensions. However, land reclamation construction work is being carried out very slowly here.

A situation developed at the Tedzhen Oasis wherein, even with an acceleration of 3-4 times in the rates for land reclamation work (for which a corresponding increase was required in the material-technical base), no less than 10 years were required for the length of the collector-drainage network to be extended to the optimum dimensions. Thus, in order to improve the reclamative status of land and in addition to building a collector-drainage network, a requirement exists for observing in a very strict manner those measures aimed at preventing the ground waters from rising and this includes: the timely cleaning and repair of the existing collector-drainage network, raising the KPD [efficiency] of the irrigation network by modernizing it and preserving its far-flung network of canals; employing the correct equipment for carrying out leaching operations, while taking into account the slope, mechanical composition and salinity of the soil; based upon large-scale salinity maps, carry out foliar waterings in a timely manner in accordance with the established watering regimes and improve their quality; planned mastering of crop rotation plans and the extensive use of progressive agricultural practices in the growing of cotton.

More favorable land reclamation conditions are to be found at the Tashauz and Chardzhou oases. The drainage module at the Tashauz Oasis is 34 percent less than the average computed norm (20-25 liters per second). At the Chardzhou Oasis, the index for drainage runoff is greater than the computed norm.

Actual Availability and Computed Requirement of a Collector-Drainage Network as of 1 January 1978

Oases	Irrigated Area thousands of hectares	Actual Length of Collector- Drainage Network, km	Computed Requirement of Collector- Drainage Network, km	Specific Length of Collector-Drainage Network, linear meters per hectare		Percent Ensured by Drainage
				Actual	Required	
Tashauz	198,419	5318.5	6945	26.9	35	76.9
Chardzhou	170,901	3875.9	5127	22.7	30	75.7
Murgab	305,968	5320.5	13769	17.4	45	38.7
Tedzhen	114.254	1605.3	5713	14.1	50	28.2

Despite the unfavorable land reclamation conditions, the specific length of the collector-drainage network at the Murgab and Tedzhen oases is 3-4 times less than the required length.

In connection with the expansion that has taken place in the construction of closed horizontal drains and land reclamation drillholes, new concerns have arisen on the farms with regard to their operation. Actually, the length of the republic's inter-farm irrigation and collector-drainage network is 5,705.8 kilometers, 31 percent of the overall length of the entire network is maintained on the balance of the aquicultural organs of the Ministry of Land Reclamation and Water Resources for the Turkmen SSR. The remaining portion -- 11,214 kilometers or 69 percent -- is intrafarm in nature and maintained on the balance of the farms themselves. At the present time, the kolkhozes and sovkhazes do not have their own repair base or highly skilled specialists in the operation of the collectors and drains, especially those of the closed type. Thus, commencing in 1977, all repair work required for maintaining the intrafarm land reclamation and aquicultural systems in proper working order has been carried out by subunits of the republic's Ministry of Land Reclamation and Water Resources.

Interfarm, rayon and oblast associations for the operation of intrafarm land reclamation and aquicultural systems have been organized and are presently in operation in the fraternal republics (RSFSR, Ukrainian SSR, Moldavian SSR and others). The associations operate on a contractual basis with the farms and they are provided with the machines necessary for carrying out repairs on the installations.

Similar systems have been created for the development and utilization of reclaimed land.

All of these associations are concerned with agricultural land reclamation matters and they belong to the system of union republic agricultural ministries and are under the jurisdiction of the Main Administration for Land Reclamation.

As a rule, those subunits or associations concerned with engineering land reclamation matters are retained on the balance of republic ministries for land reclamation and water resources. Taking into account the experience accumulated in the fraternal republics, an administration for agricultural land reclamation services should be organized in our republic.

7026

CSO: 1824

TILLING AND CROPPING TECHNOLOGY

IMPROVING SOIL SALINITY CONDITIONS IN BEHALF OF COTTON CROP

Ashkhabad TURKMENSKAYA ISKRA in Russian 6 Feb 80 p 2

[Article by A. Khudaykuliyeu, Doctor of Agricultural Sciences and corresponding member of VASKhNIL and Kh. Barayev, Candidate of Agricultural Sciences: "Effectiveness of Leaching Waterings"]

[Text] A large portion of the republic's irrigated land is characterized by different degrees of salinity. On some tracts, those lacking thorough leaching, the cotton seedlings grow in a sparse manner and this results in considerable crop losses.

The effectiveness of leaching waterings is dependent upon the quality of preparation of the land to receive water and mainly upon the leveling off of the tracts to be watered. On those farms where proper importance is being attached to the carrying out of this agricultural measure, the desired results are being achieved from leaching waterings -- the salt is receding.

On tracts that have not been leveled off properly, the salts are being removed from the soil in an irregular and incomplete manner. On saline patches of land, the result of careless leveling off work and quite often constituting 20-30 percent of an area, the cropping power of cotton in many instances amounts to only 5-6 quintals, compared to 25-30 quintals being obtained from properly leveled off tracts.

As a mandatory agricultural measure for smoothing out those irregularities in a microrelief which form following the principal plowing work, current leveling off work must be carried out annually on all fields, using long-base planers and other items of equipment.

The thorough smoothing out of a field's surface is achieved by operating the planers in both the longitudinal and transverse directions. Moreover, no limitation should be placed upon the number of passes carried out. The leveling off work is considered to be completed when the entire area of a field has been smoothed out.

Within the complex of agricultural measures employed for preparing saline lands, special importance is attached to the correct laying out of the watering check plots. On leading farms, proper consideration is given to the mechanical composition of the soil, the degree to which the tract has been leveled off and to its slope. On land having very little slope and consisting of soil of either medium or heavy composition, the size of the watering check plot does not exceed one half to one hectare.

In the cotton growing zones, use is made of methods and a technology for preparing land for leaching waterings that have been checked over the course of many years of operational practice. On farms in Chardzhouskaya Oblast, for example, small check plots have been made available; this is promoting uniform flooding of the plots and the economic consumption of water.

In Tashauzskaya Oblast, on thoroughly leveled off tracts, the check plots are larger -- ranging in size from 1-2 to 4 hectares. On tracts that have been properly leveled off, this serves to ensure uniform distribution of the water throughout a tract.

In the interest of raising the effectiveness of the leaching work, the laying out of the check plots and the arrangement of the irrigation units must be carried out in a manner so as to ensure that each check plot is filled with water and leached independently. However, attempts are being made on a number of farms to simplify the technology of preparing land to receive water. On many farms the water is being passed from one check plot to another. This reduces the amount of water consumed during the leaching work and, as a result, the soil is not leached in the desired manner.

I would like to draw the attention of specialists to one important consideration -- the quality of laying out of the check plots. The effectiveness of watering is dependent upon the manner in which they are arranged. At kolkhozes along the central flow of the Amu-Dar'ya River, the check plots are wide at the base (110-120 centimeters) and 70-80 centimeters high, with use being made of land packers. Even following a threefold release of water, a check plot remains firm and an individual may walk across its surface in a confident manner. The alteration of checkers using rollers employed at kolkhozes in Chardzhouskaya Oblast is not a complicated operation. The chairmen of many kolkhozes in Maryyskaya and Ashkhabadskaya oblasts have on more than one occasion paid visits to farms in Chardzhouskiy Rayon and acquainted themselves with the simple devices. Moreover, they admired the quality with which the check plots were laid out. Unfortunately however, they chose not to employ these methods on their own farms.

Bulldozers should not be used for laying out the check plots, although some farms in Maryyskaya Oblast are doing just this. Such practice tends to disrupt the level nature of a field and the check plots lose their firmness and portions break down. In low areas the water stagnates, the

soil requires a greater length of time for drying out and the pre-sowing preparation of the soil is delayed.

On sloping lands in the Prikopetdagskaya piedmont plain region, leaching and water supply waterings are carried out by means of furrows. How can high quality waterings be ensured? First of all, the length of the furrows and the size of the watering jet must be determined correctly, taking into account the mechanical composition and water permeability of the soil. On heavy textured and weakly-permeable soils, the length of the furrows must not exceed 300-400 meters and on light textured soils -- no more than 200-250 meters. The size of the watering jet, for a furrow width of 60 centimeters, should be such as to provide for an average flow of 0.5 - 0.6 liters per second. It can be increased and this will promote an increase in the labor productivity of the irrigation personnel. But the situation must be monitored to ensure that the soil in the furrows does not wash away or erode. In order to achieve uniform water distribution throughout the width of a field, the furrow caps are reinforced. The leaching waterings are carried out using open furrows, with the discharge being utilized for irrigating lower tracts. The amount of water discharge must not exceed 30-40 percent.

The leaching work commences with the heavy textured and strongly saline tracts, the desalinization of which requires a large quantity of water and filling of the check plots three or four times. On tracts having lighter textured and less saline soils, where the ground waters lie at a greater depth, the waterings are carried out later. And they are combined with water supply irrigation or pre-sowing waterings.

The leaching norms and the frequency of waterings are differentiated taking into account the degree of soil salinization. Towards this end, one should ideally be guided by the large scale soil maps which are available on the farms.

Similar to any type of work, the leaching of saline lands must be planned in an efficient manner, both for a farm on the whole and by brigades. This will make it possible to carry out the land preparation and irrigation work during the best periods and in a high quality manner.

7026

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TILLING AND CROPPING TECHNOLOGY

IRRIGATION EXPERIMENT WITH DRAINAGE WATER DESCRIBED

Ashkhabad SEL'SKOYE KHOZYAYSTVO TURKMENISTANA in Russian No 12, Dec 79
pp 30-31

[Article by D. Sheripov, Candidate of Agricultural Sciences and head of the Laboratory for the Use of Mineralized Waters in the National Economy at the Institute of Deserts of the Academy of Sciences for the Turkmen SSR:
"Drainage Water -- For Irrigation"]

[Text] The development of irrigation farming throughout the republic is very closely associated with raising the cropping power of agricultural crops, taming new tracts of virgin land and improving the land reclamation status of old irrigated lands. The Turkmen SSR has tremendous land resources at its disposal which are suitable for irrigation. Extensive land reclamation work is being carried out in the interest of developing these lands for agricultural purposes. However, the development of new lands and the watering of deserts requires expenditures of great volumes of water, a shortage of which is already being experienced at the present time. The Amu-Dar'ya River is the principal source of water for the central asian republics. The spring and summer runoff from this river is under study at the present time for irrigation purposes and the runoff from such rivers as the Murgab and Tedzhen has been completely under control for some time now. Hence the development of such land is based upon the runoff from the Kara-Kum Canal imeni Lenin and requires the finding of additional sources for irrigation. This includes primarily weakly mineralized drainage, underground and also sea waters. In recent years the flow of drainage water in the republic, beyond the limits of the oases, has amounted to approximately 5.0 cubic kilometers and in the future it is expected to increase to 7-8 cubic kilometers. Weakly mineralized underground waters that are suitable for agricultural use are available in parts of the Kara-Kum territory.

On the basis of data obtained from preliminary experiments, carried out in various zones of the republic, weakly mineralized waters can be used for the desalinization of soils and for the irrigation of forage and other agricultural crops. During years marked by limited water conditions, such

as 1965 and 1974, drainage waters in mixtures or in combination with irrigation water were used for the irrigation of cotton. However, proper concern was not evidenced for their extensive use for irrigation purposes.

For the purpose of studying the effect on the salt regime and cropping power of agricultural crops of extended irrigation using mineralized waters, field experiments were carried out at the Leninizm Kolkhoz in Vekil'-Bazarskiy Rayon in Maryyskaya Oblast, by workers from the Institute of Deserts of the Academy of Sciences of the Turkmen SSR, under the direction of Academician of VASKhNIL [All-Union Academy of Agricultural Sciences imeni V.I. Lenin] and the Academy of Sciences of the Turkmen SSR I.S. Rabochev.

The test plot (an area of 10 hectares) was located on the right bank of the Dzhar-Say collector. The soils turned out to be of desert-sand and takyr types; their mechanical composition was of the sandy loam and loamy varieties, with the participation of shallow clay layers. The average volumetric weight in the 1-meter soil layer was 1.5 grams per cubic centimeter and the specific weight -- 2.69 grams per cubic centimeter. They are weakly saline and the dense residue content in the arable layer (0-25 centimeters) changes from 0.10 to 0.25 percent. The type of salinization is chloride-sulphate according to the anions, with the sodium content predominating in terms of the cations. The humus content in the soils is not very great and fluctuates within the limits of 0.5-1.0 percent, the total nitrogen supply is approximately 0.04-0.06 percent, mobile phosphorus -- 10-17 milligrams per kilogram and K_2O -- 25-35 milligrams per 100 grams of soil.

The ground water level on the plot -- 200-250 centimeters from the daily surface of the earth. The type of salinization for the ground waters was chloride-sulphate and their mineralization -- 5-7 grams per liter.

The experiments were carried out in the following variants: I - irrigation using irrigation ditch water; II - irrigation using weakly mineralized water, 3-4 grams per liter; III - irrigation using weakly mineralized water, 5-6 grams per liter.

The following crops were sown: rice, Sudan grass, joughara, corn. The rice crop was sown against the background of the interrasyon Dzhar-Say collector for the first 3 years (experiment workers Ch. Reyimov, I.I. Yurashkevich), with constant flooding and with an overall annual irrigation norm of 50,000 - 52,000 cubic meters per hectare. Thereafter, in connection with the raising of the ground water level, open horizontal drainage was arranged on the plot. Such drainage provided the background for the irrigation of forage crops for a period of 4 years. The foliar irrigation norm for corn and joughara amounted to 5500-6000 cubic meters per hectare and for Sudan grass -- 7000-8000 cubic meters per hectare. The degree of water mineralization required for irrigation was obtained in the basin: where salt drainage water was obtained on the one hand and, on the other, fresh

irrigation ditch water. The mineralization of water was measured using a hydrometer and salt gauge of VSEGINGEO [All-Union Scientific Research Institute of Hydrogeology and Engineering Geology].

Soil samples for a complete water extract were taken every 25 centimeters to a depth of 2 meters. Ground water samples were selected prior to agricultural crop vegetation (in the spring) and following vegetation in October.

In order to observe the dynamics of ground water salinization, six boreholes were drilled on the plot and piezometers installed at depths of 5, 10, 15, 20 and 30 meters.

The agricultural practices employed in the growing of rice and forage crops were carried out in conformity with recommendations handed down by the Ministry of Agriculture for the Turkmen SSR.

The average data, for a period of many years, on the cropping power of the agricultural crops is furnished in the following table.

Cropping Power of Rice and Forage Crops
(averages over a period of many years)

Crop	Variant	Cropping Power, quintals per hectare	
		Fodder	Grain
Rice	I	-	38.9
	II	-	23.6
	III	-	17.8
Sudan grass	I	538	-
	II	509	-
	III	446	-
Joughara	I	457	55.4
	II	421	48.9
	III	326	45.6
Corn	I	504.5	57.8
	II	406	52.0
	III	385	40.1

The data in the table reveals that when mineralized waters are used for irrigation the rice yield decreases (in variants II and III), compared to the yield obtained when irrigation ditch water is used (variant I). This is explained by the change that takes place in the salt regime of the irrigated plot. Thus the soil and ground waters became desalinized during the 3 years in which the rice was irrigated using fresh water and when mineralized water was used for irrigation (variant III) the content of salts in the

0-200 centimeter layer increased from 89.0 tons per hectare to 142.5 tons per hectare.

The highest cropping power for forage crops was obtained when fresh water was used for irrigation. As an increase took place in the mineralization of the irrigation water, a reduction in the fodder and grain yield was noted. A migration of salts also takes place during the course of irrigating the forage crops using water of varying degrees of mineralization. Following 7 years of irrigation (rice, forage crops) using fresh and mineralized waters, a substantial change was noted in the salt composition of the soil, by variants and layers. The redistribution of these salts is greatly dependent upon the concentration of the irrigation water and the initial degree of soil salinization.

When water of a medium degree of mineralization is employed for irrigation, the desalinization of the soil takes place at a more intensive rate and the salts migrate only in the one vertical direction, that is, from the zone of aeration to the natural soil.

The rates and duration of salt migration in the soil are mainly dependent upon the nature of the salt solution.

During extended irrigation, the chloride ion, as a readily mobile element, accumulates in the ground water or moves into an adjoining non-irrigated sector. The SO_4 ion is less mobile and the rate of its movement is negligible; it combines readily with the soil colloids or, upon joining up with other cations, it forms a new compound that is neither readily soluble nor highly mobile. Thus, for example, the quantity of Na_2SO_4 decreases compared to the initial content, following fresh water irrigation over a period of 3 years. In addition, the formation of new salts -- CaSO_4 and MgCl_2 -- is also noted. An opposite picture is observed when weakly mineralized water is used for irrigation: an increase takes place in the amount of not too readily soluble salts $\text{Mg}(\text{HCO}_3)_2$, while at the same time the content of CaSO_4 , Na_2SO_4 and NaCl decreases sharply.

Extended irrigation changes to a considerable degree the nature of the salts in the ground water.

At the end of the period under study and with the aid of chemical analyses, certain peculiarities were revealed in the salt compounds. Differentiation and metamorphization of the salts were clearly revealed. The concentration of dense residue at the 5-30 meter depth, based upon piezometers, differed.

At the 30 meter depth in Variant III, where use was made of weakly mineralized waters, the amount of dense residue reached 32.3 grams per liter, whereas at a depth of 5 meters -- 7.3 grams per liter.

Where there was a high concentration of salts, a reduction took place in the number of bicarbonates. The number of magnesium and calcium cations

decreases somewhat as an increase takes place in the mineralization of the irrigation water. For salt concentrations of 32.3 and 46.3 grams per liter, the number of magnesium and calcium ions was 1.4 and 0.4 grams per liter respectively and for 3.3 and 5.7 grams per liter for magnesium and calcium respectively the values were 0.4-0.2 and 0.2-0.3 grams per liter.

The studies carried out make it possible to propose a number of specific recommendations for using weakly mineralized waters for the irrigation of agricultural crops.

First of all, every attempt should be made to develop land having a deep stand of ground waters at the terminal portions of canals, where a shortage of irrigation water is experienced and also solonchak, long fallow and fallow land of light mechanical composition and sandy oasis tracts of land. In order to achieve the best results when the ground waters are close to the surface, the leaching and irrigation work should be carried out only under conditions of good active horizontal and vertical drainage. In the process, a salt content of up to 5 grams per liter is permissible in collector-drainage waters. Waters of a sulphate hydrocarbonate and magnesium-calcium composition are acceptable in terms of their chemical composition. The calcium carbonate and gypsum content in soil exerts a favorable effect on the chemism of soils irrigated using mineral waters.

The use of mineralized waters for irrigation purposes will make it possible to compensate for the shortage in irrigation water and it will promote an additional expansion in the area used for the cultivation of agricultural crops.

/026

CSO: 1824

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